A DIMENSION ANALYSIS OF THE ACADEMIC SELF-CONCEPTS OF ELEVENTH GRADE UNDER- AND OVERACHIEVING STUDENTS

By

DAVID ALLEN PAYNE

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

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Approved William W. Farquhar

ABSTRACT

A DIMENSION ANALYSIS OF THE ACADEMIC SELF-CONCEPTS
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by David Allen Payne

The study was concerned with 1) the development of an objective measure of academic self-concept, and 2) a dimension analysis of the discriminating items. Item discrimination was determined on samples of statistically defined under- and overachieving eleventh grade students of each sex. The following assumptions were made, 1) self-concept is a functionally limiting factor in school achievement, 2) the student learns what he perceives he is able to learn, 3) significant others, particularly the teacher, have important influences on the development of a student's self-concept, in the form of expectancies, which in turn affects his ability to perform in the academic setting, and 4) under- and overachieving students have significantly different academic self-concepts.

A one-hundred and nineteen item rating scale was developed which purported to measure academic self-concept. Using a four point scale, the student was asked to rate one, two, or three word concepts and phrases as he thought his teacher would in describing him as a student. It was found that 48 items significantly discriminated between under- and overachievers for each sex after cross-validation. Analysis of variance reliability estimates ranged from .90 to .93 for males and from .88 to .93 for females in various samples.

A multiple scalogram dimension analysis of the discriminating

items for each sex was performed. This technique, a generalization of Guttman's scalogram procedures, yielded four interpretable dimensions for males and five interpretable female dimensions which accounted for 96% and 98% of the cross-validated items for males and females respectively.

The reproducible males dimensions were labeled as follows:

D_1 Achievement via Traditional Academic Role Taking

D_2 Achievement via Academic Conformity

D_3 Achievement via Intrinsic Motivation

D_4 Achievement via Unique Accomplishment

The reproducible female dimensions were labeled as follows:

D_1 Achievement via Traditional Academic Role Taking

D_2 Achievement via Peer Normative Competition

D_3 Achievement via Academic Independence

D_4 Achievement via Meeting Teacher Expectations

D_5 Achievement via Intellectualizing

The research was supported by funds granted by the U.S. Office of Education, as part of a study under the direction of William W. Farquhar, entitled, A Comprehensive Study of the Motivational Factors Underlying Achievement of Eleventh Grade High School Students, Research Project No. 846 (8458).

CHAPTER I

FORMULATION AND DEFINITION OF THE PROBLEM

The obvious fact that a command of basic academic skills is necessary for successful scholastic performance has been repeatedly demonstrated. However, estimates of academic success based on general ability, academic skill or aptitude measures only define part of the predictive variance. In an attempt to isolate factors which might account for more variance, researchers have increased their investigations of non-intellectual or personality variables related to academic achievement.

Educational psychologists and sociologists have attempted to delimit the study of academic dynamics by investigating the dimension of personality labeled self-concept.[1,2] The academic self-concept research trend is demonstrated by a cursory review of articles in recent psychological and educational journals. Also indicative of the growing research interest in self-concept is the increase in research grants being made available by public and private agencies, e g. the Cooperative Research Branch of the U.S. Office of Education is encouraging research relating self-concept to academic achievement by

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[1]Merville C. Shaw, K. Edson & H. M. Bell, "The Self-Concept of Bright Underachieving High School Students as Revealed by an Adjective Check List", Personnel and Guidance Journal, 1960, Vol. 39, pp. 193-196

[2]R. M. Roth, "Role of Self-Concept in Achievement", Journal of Experimental Education, 1959, Vol 27, pp. 265-28.

financial support of investigations by Combs,[1] Bledsoe,[2] and Brookover.[3]

Purpose of the Study

Despite the fact that researchers have attempted to relate gross measures of self-concept to academic performance, few definitive investigations have been made. Too few researchers of academic self-concept have made the content of their self concept referents plausibly relevant to the criterion variables under investigation. The purpose of this study was to explore the academic self-concepts of eleventh grade high school students with an attempt to overcome the above limitations.

Need for the Study

The construction and analysis of such a measure of academic self-concept can be justified solely because it permits better educational selection and placement. A dimensional analysis, by revealing the underlying structure which accounts for the effective functioning of the proposed instrument, may provide the foundations upon which an even

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[1]Arthur W. Combs, The Relationship of Child Perceptions to Achievement and Behavior in the Early School Years, Research Project No. 814, Supported by the U. S. Office of Education in cooperation with the University of Florida, 1959

[2]Joseph C. Bledsoe, The Self-Concepts of Elementary School Children in Relation to Their Academic Achievement, Intelligence, Interests, and Manifest Anxiety, Research Project No. 1008, Supported by the U.S. Office of Education in cooperation with the University of Georgia, 1960

[3]Wilbur W. Brookover, Relationship of Self-Images to Achievement in Junior High School Subjects, Research Project No. 845, Supported by the U. S. Office of Education in cooperation with Michigan State University, 1959.

more successful measure can be built. Moreover, the subsidiary value of strengthening the curriculum, teaching methods, and counseling procedures by better understanding the nature of what dimensions are inherent in the academic self-concepts of students, further emphasizes the need for this study. The value of such an instrument for further research, particularly experimental research, is obvious.

Statement of the Problem

It was the problem of this investigation to construct, validate and cross-validate an instrument which purports to measure the academic self-concepts of male and female eleventh grade high school students. The problem was also concerned with the determination, by multiple scalogram analysis, of the psychological dimensions of such an instrument. The investigation developed as part of a research project sponsored by the United States Office of Education, under the direction of William W. Farquhar.[1] This project, hereafter referred to as the Farquhar Motivational Research Project, was concerned with the development of an objective battery of tests which measured various aspects of motivation for academic achievement. In the final analysis, the problem of the present investigation was to determine the number, nature, magnitude and structure of the dimensions of academic self-concept. The theory on which this study is based is developed as follows.

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[1]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying Achievement of Eleventh Grade High School Students, Research Project No. 846 (8458); Supported by the U.S. Office of Education, in cooperation with Michigan State University, 1959

Academic Self-Concept Theory

The four basic tenets of a theory of academic self-concept are presented in this section. Following each tenet is a discussion of its theoretical and research base.

Although it is recognized that innate factors may set limits on learning ability, it is also recognized that few students achieve near the level set by inherent capacity. One factor which may functionally limit the learning of many students is a low or negative self-concept as a school learner.

The basic theory that self-concept is a functionally limiting factor in school achievement emerges from the perceptual approach to individual behavior as expressed by Combs and Snygg,[1] and Brookover,[2] and the symbolic interaction frame work of social psychology derived from George H. Mead,[3] and Charles H. Cooley.[4]

The basic tenets of the academic self-concept are summarized by Brookover.[5]

> I: Persons learn to behave in the ways that each perceive as appropriate to himself.

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[1]Arthur W. Combs and D. Snygg, Individual Behavior, New York: Harper & Brothers, (Revised Edition), 1959

[2]Wilbur B. Brookover, "A Social Psychological Conception of Classroom Learning", School and Society, 1959, Vol. 87, pp. 84-87

[3]George H. Mead, Mind, Self, and Society, Chicago: University of Chicago Press, 1934

[4]Charles H. Cooley, Human Nature and the Social Order, New York: Scribner's, 1902

[5]Wilbur B. Brookover, "A Social Psychological.....", pp. 86

Combs and Snygg have postulated that all behavior, "...without exception, is determined by the perceptual field at the moment of action".[1] This perceptual field constitutes the universe of experience for each individual. The perceptual system gives meaning to each individual's experiences so that people do not behave according to the facts as others see them, but according to the facts as they see them.

II. Appropriateness of behavior is defined by each person through internalization of the expectation of significant others.

Tenet Two necessitates a consideration of the development of the self-concept. The "self" arises in the process of social experience. The development occurs within a matrix of social interaction. The influence of the "significant other" within this matrix is described by Mead;[2]

> It is by means of reflexiveness--the turning back of experience of the individual upon himself--that the whole social process is brought into the experience of the individuals involved in it; it is by such means, which enable the individual to take the attitude of the other toward himself, that the individual is able consciously to adjust himself to that process....

The mechanism by which the influence is assimilated is described by Cooley as a "looking-glass-self". The reflection of self is hypothesized as consisting of three principle parts:

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[1]Arthur W. Combs & D. Snygg, Individual Behavior, New York: Harper & Brothers, (Revised Edition), 1959

[2]George H. Mead, Mind, Self, and Society, Chicago: University of Chicago Press, 1934, p. 134

> ....the imagination of our appearance to the other person; the imagination of his judgment of that appearance, and some sort of self-feeling....[1]

Empirical evidence has been presented by Helper to support the hypothesized relationship between "significant others" and the development of an individuals self-concept.[2] He found that children's self-concepts were similar to the self-concepts of their parents. Significant others are defined as those individuals from whom self-relevant data is abstracted. They may exert either a positive or a negative influence on the individual.

> III: The functional limits of one's ability to learn are determined by his self-conception or self-image as acquired in social interaction.

From a perceptual viewpoint, if intelligence, as Combs[3] would define it, is the capacity for effective behavior, the intelligence of an individual will be dependent upon the richness and variety of perceptions possible to him at a given moment. However, perception is a selective process. One's self-concept is a vital factor in determining the type of perception selected. An example of the operation of this tenet is presented by Combs.[4]

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[1]Charles H. Cooley, Human Nature and the Social Order, New York: Scribner's, 1902, p. 152

[2]Malcolm M. Helper, "Learning Theory and Self-Concept", Journal of Abnormal and Social Psychology, 1955, Vol. 51, pp. 184-194

[3]Arthur W. Combs, "Intelligence From a Perceptual Point of View", Journal of Abnormal and Social Psychology, 1952, Vol. 46, pp. 662-673

> ...The child who believes himself unable to read, confronted with the necessity for reading, is more likely than not to do badly. The external evaluation of his teachers, and fellow pupils, ...all provide proof to the child of how right he was in the first place.

The possession of a particular self-concept tends to produce behavior that corroborates the self-concept on which the behavior originated.

> IV: The individual learns what he believes significant others expect him to learn in the classroom.

Theoretically the self-concept is viewed as a learned structure, growing mainly from comments made by other people and from inferences drawn by children out of their experiences in home, school and other social groups. Teachers, therefore, being significant others, can be seen as potentially having an extremely important influence on the development of a child's self-concept, and thereby his school performance. Staines, for example, demonstrated that teachers, through their roles as significant others to students, can cause actual changes in the self-concepts of their students by giving positive comments and creating an atmosphere of greater psychological security.[1] Furthermore, Staines found that the interaction of teacher and student had an effect on self-concept which improved achievement.

The four basic tenets of the above academic self-concept theory may be summarized as follows: 1) the child learns what he perceives he is able to learn, and 2) the teacher, as a significant other, has an

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[1] J. W. Staines, "Self-Picture as a Factor in the Classroom", British Journal of Educational Psychology, 1956, Vol. 28, pp. 97-111

important influence on the development of a child's self-concept, which in turn affects his ability to perform in the academic setting.

From the above academic self-concept theory a number of hypotheses are generated.

The Hypotheses

The basic assumption was made that under- and overachieving students hold different conceptions of themselves as learners, manifested in the fact that their academic performance is not commensurate with their measured scholastic aptitude. (See Chapter III for a statistical definition of under- and overachievement.)

The further assumption was made that an instrument could be developed to measure academic self-concept, and that this instrument could be validated and cross-validated. The discriminative power of such an instrument could be determined on the basis of a disproportionate selection of certain items by a given discrepant achievement group.

It is hypothesized that psychologically meaningful dimensions exist within a measure of academic self-concept.

In as much as research literature indicates sex differences in self-concept, the determination of sex differences in the academic self-concepts of males and females will form a secondary phase of this study.

The over-all approach of the present investigation is not toward the classical form of hypothesis testing. Concern is generally with exploration, with a view toward redefinition and expansion of

theory. The only significance test applied will be those involved in item analyses.

Statement of the Hypotheses

Major Hypothesis I: Under- and overachieving students will differ significantly on a measure of academic self-concept.

Major Hypothesis II: The dimensions of a measure of academic self-concept can be determined.

Minor Hypothesis I: The items selected from the measure of academic self-concept will be different for males and females

Minor Hypothesis II: The dimensions of academic self-concept will be different for males and females.

Organization of the Study

The over-all plan of this dissertation is as follows: In Chapter II a review of research literature related to current investigation is presented. A discussion of the general design of the study, together with consideration of instrumentation, sample selection, and the analytic procedure used in dimension analysis of a measure of academic self-concept is presented in Chapter III. The analysis of the data is reported in Chapter IV, while the summary, conclusions, and implications for further theory development and research appear in Chapter V.

CHAPTER II

REVIEW OF RELATED RESEARCH LITERATURE

In recent years, the research in self-concept has proliferated. Silver reports that in the 1939 Psychological Abstracts, six references pertaining to the self, self-concept, or ego are found.[1] In 1949 nine references are listed, and 1956, 54 articles are indexed. In the 1959 issues 122 references pertaining to this area of research are present.

Theoretical Considerations of Self-Concept

Most contemporary self theories derive directly or indirectly from William James discussion of what he called the "Empirical Me".[2] James' "self" was considered to be the sum total of all that a man can call his: including his body, traits, and abilities; his material possessions; his family, friends and enemies; his vocation and avocation.

The term self as used in contemporary social science literature has two generally accepted meanings.[3] In the first definition, self-as-an-object, reference is made to an individual's attitudes, feelings, perceptions, and evaluations of himself as he views himself. In this sense, self is what a person thinks of himself. In the second definition,

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[1]A. W. Silver, The Self Concept: Its Relationship to Parental and Peer Acceptance, Doctoral Dissertation, Michigan State University, 1957

[2]William James, Principles of Psychology, New York: Holt, 1890 Chapter 10

[3]Calvin S. Hall and G. Lindzey, Theories of Personality, New York: John Wiley, 1957, p. 468

self-as-a-process, self is regarded as a group of psychological processes which govern behavior and adjustment. The self is considered a functioning object which consists of an active group of processes such as thinking, remembering, and perceiving.

Comprehensive reviews of the psychology of the self are presented by Hamachek,[1] Hall and Lindzey,[2] Symonds,[3] and Sarbin.[4] It is apparent from the literature that there is no agreement on the use of the term "self". However, a predominant trend is concerned with relating self-concept theory to perceptual theory. Reviews of this emerging area of speculation and investigation are presented by Gordon and Combs,[5] and Wylie.[6]

The theory that the self-concept of an individual is developed through interaction with significant others has been expressed previously. (See Chapter I). Two recent investigations give credence to the operationalism of such a theory. Chertok presents research findings

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[1]Donald E. Hamachek, Relationships Between the Self-Images of Elementary School Children and Certain Measures of Growth, Doctoral Dissertation, University of Michigan, 1960

[2]Calvin S. Hall & G. Lindzey, Theories of Personality, New York: John Wiley, 1957, pp. 469-489

[3]P. M. Symonds, The Ego and The Self, New York: Appleton-Century-Crofts, 1951

[4]Theodore R. Sarbin, "Role Theory", in G. Lindzey (Ed.) Handbook of Social Psychology, Reading: Addison-Wesley, 1954, pp. 238-258

[5]Ira J. Gordon & A. W. Combs, "The Learner: Self and Perception", Review of Educational Research, 1958, Vol. 28, pp. 433-444

[6]Ruth C. Wylie, The Self Concept, Lincoln: University of Nebraska Press, 1961

which suggest that the interactional or behavioral aspects of relationships are more important in the development and maintenance of self-conception than are the more purely affective factors of such relationships.[1] In an important study by Mannheim, the following assumptions were made, 1) self- mage should be affected by the frame of reference which the individual adopts from his major identification group, 2) the frame of reference relevant to the self-image is the consensus of the reference group about the self-image, and this consensus is presumably perceived by the individual as his "looking-glass-self", and 3) it is through the "looking-glass-self" that the identification reference group is assumed to influence the self-image.[2] Mannheim found that the self-image tended to be similar to the "looking-glass-self" reflected from the reference group, regardless of whether the individual did or did not consider himself a member of the referent group. Results from both of the above studies demonstrate that the symbolic interactionist theory of self-concept developed by Cooley and Mean can be empirically tested with an acceptable validity.

Definition of Self-Concept

As has been noted, self-concept may be conceptualized as referring to a global attitude toward the total self, or it may refer to certain

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[1]Ely Chertok, The Social Process of Self-Conception, Doctoral Dissertation, University of Washington, 1955, Dissertation Abstracts 1955, Vol. 15, p. 2330

[2]Betty F. Mannheim, An Investigation of the Interrelations of Reference Groups, Membership Groups, and the Self Image: A Test of the Cooley-Mead Theory of the Self, Doctoral Dissertation, 1957, Dissertation Abstracts, 1957, Vol. 17, pp. 1616-1617

traits or areas of functioning. Some investigators assume that specific self-concept measures are interchangeable indices of global self-concept. This is not a valid assumption as the developing individual reacts to his environment not with his total personality, but as he sees the specific situation, and relates them to similar previous experiences. The variable definitions which have been attached to self-concept, ranging from prescribed to broad meanings, has resulted in much confusion not only within research studies, but also across investigations. For the purposes of this review and the present investigation, self-concept will be defined as:

> The person as known to himself, particularly the stable, important and typical aspects of himself as he perceives them.[1]

Academic self-concept, following logically then, will be defined as:

> The total aggrigate of those aspects of the way an individual views himself which might be related to academic achievement. These aspects are perceived as being reflections of expectations of his academic "significant other", particularly the teacher.

Measurement and Self-Concept

The problems of reliability and validity of self-concept measures, and the design difficulties of studies using self-concept measures have been competently reviewed elsewhere.[2,3] It was found that five general

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[1]Arthur W. Combs & D. Soper, "The Self, It's Derivative, Terms, and Research", Journal of Individual Psychology, 1957, Vol. 13, pp. 134-135

[2]Ruth C. Wylie, The Self Concept, Lincoln: University of Nebraska Press, 1961, pp. 23-113

[3]Theodore R. Sarbin, "Role Theory", in G. Lindzey (Ed.) Handbook of Social Psychology, Reading: Addison-Wesley, 1954, pp. 244-245, 253-255

types of instruments have been used--1) rating scales, 2) questionnaires, 3) adjective check lists, 4) coded interviews, and 5) Q-sorts. In consideration of the five types of measures, Wylie states:

> At present no general conclusion can be drawn concerning any one instrument or type of instrument, because the array of studies is too widely scattered across instruments.[1]
>
> It is concluded that no investigator to date has satisfactorily conceptualized or coped with these difficult measurement problems. Quite a few have indicated that they make no claims for.....validity and are content to 'let the reader beware',.....[2]
>
> In the majority of studies no reliability estimates are given, and those that are presented are mostly of the split-half or interjudge variety,.....[3]

The present investigation is designed to overcome the pitfalls Wylie highlights.

Dimensions of Self-Concept

Investigators of self-concept have primarily been concerned with global or gross measures. Few attempts have been made to determine the basic dimensions of self-concept. Furthermore, when such dimensions have been determined, the researcher has not made further investigations of them. A summary of dimensions, as determined in previous self-concept invetigations, might provide clues of what results

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[1]Wylie, The Self Concept, p. 37

[2]Wylie, The Self Concept, p. 39

[3]Wylie, The Self Concept, p. 39

might be obtained from a dimension analysis of the measure of academic self-concept developed in the present investigation. A summary of these dimensions is presented in Table 2.1. The investigations summarized are those of; Martire,[1] Dawkins,[2] Smith,[3] and Osgood, Suci, and Tannenbaum.[4]

Table 2.1

Dimensions of Self-Concept Isolated in Previous Investigations

Investigator			
Martire(1956)	Dawkins(1957)	Smith(1960)	Osgood, et.al.(1957)
Intelligence	Intellectual	Independence	Evaluative
Motivation	Motivational	Self-Esteem	Potency
Creativeness	Emotional	Anxiety-Tension	Activity
Initiative	Social	Estrangement	
Success	Physical	Body Image	

All the dimensions, with the possible exception of those determined by Osgood, et. al., are self-explanatory. The dimensions in this

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[1]J. G. Martire, "Relationships Between the Self-Concept and Differences in the Strength and Generality of Achievement Motivation", Journal of Personality, 1956, Vol. 24, pp. 364-375

[2]Peter B. H. Dawkins, The Construct Validity of a Self-Rating Scale, Doctoral Dissertation, University of Texas, 1957, Dissertation Abstracts, 1957, Vol. 17, p. 2678

[3]Philip A. Smith, "A Factor Analytic Study of the Self-Concept", Journal of Consulting Psychology, 1960, Vol. 24, p. 191

[4]Charles E. Osgood, C. J. Suci, & P. H. Tannenbaum, The Measurement of Meaning, Urbana: University of Illinois Press, 1957

later study were derived by factor analysis and were viewed as descriptions of the meaningfulness of concepts, rather than strictly unique to self-concept. It was found that these three factored dimensions accounted for 66% of the variance in a factor analysis of a bipolar adjective checklist. An evaluation of Table 2.1 indicates that those aspects of an individuals self-concept which are prominent, are those characterized by concern with intelligence, motivation, body image, and emotions.

The summarized dimensions are to be accepted with caution because each investigator used a different measure and analytic procedure. It seems obvious that if psychological interpretation is to be made of self-concept, and academic self-concept, the dimensions inherent in this structure must be determined.

Self-Concept Related to Academic Achievement

Evaluation of research relating self-concept to academic achievement is difficult for three reasons; 1) the lack of consistency in type of self-concept measure used, 2) the lack of comparability of samples, and 3) the uniform lack of agreement in the method of determining relationships. Taking these limitations into consideration an attempt will be made to integrate the most significant and relevant research to the present investigation.

The three investigations most directly related to the problem

under consideration are those of Brookover, et. al.,[1] Davidson and Lang,[2] and Shaw, et. al.[3] In the Brookover study evidence is presented for the functional operation of the "looking-glass-self" conceptualization of self-concept, as it relates to academic achievement. Two experimental rating scales were developed to meet Guttman's criterion of unidimensionality.[4] These were labeled Self Concept of Ability and Importance of Grades. A summary of the research results currently completed on the first scale are presented in Table 2.2. The preliminary results in Table 2.2 demonstrate that high achievers had a significantly higher mean self-concept score than the underachievers, even though these two groups have comparable I.Q.'s. The same interpretation is true of the difference between the mean self-concept of ability scores of overachievers and low achievers, who also had comparable I.Q.'s. Further results from the Brookover study are to be found in Table 2.3. These results are self-explanatory, with one exception. Changes in the correlations of self-concept and grade point average, with importance of grades, when the importance of grades was partialed

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[1]Wilbur B. Brookover, A. Velinsky, & S. Thomas, "Relationship of Self-Images to Achievement in Junior High School Students", Paper read at Annual Meeting of American Educational Research Association, Chicago, February, 1961

[2]Helen H. Davidson, & G. Lang, "Children's Perceptions of Their Teacher's Feelings Toward Them Related to Self-Perception, School Achievement and Behavior", Journal of Experimental Education, 1960, Vol. 29, pp. 107-118.

[3]Merville C. Shaw, K. Edson, & H. M. Bell, "The Self-Concept of Bright Underachieving High School Student as Revealed by an Adjective Check List", Personnel and Guidance Journal, 1960, Vol. 39, pp. 193-196

[4]Louis Guttman, "The Basis for Scaleogram Analysis", In S. A. Stouffer et. al. Measurement and Prediction, Princeton: Princeton University Press, 1950, pp. 60-90

out, lends support to the conclusion that the self-concept of ability scale is measuring something other than concern about achievement. It

Table 2.2

Summary of Mean "Self-Concept of Ability" Scores of Different Achievement Groups (Brookover et.al.)

		N	High Achievers	N	Underachievers	Significance Level
High I.Q.	Males	172	29.94	26	26.17	.001
	Females	171	30.74	26	27.27	.001
			Overachievers		Low Achievers	
Low I.Q.	Males	38	27.67	160	24.58	.001
	Females	35	29.58	158	25.70	.001
			High GPA		Low GPA	

was also found that teachers were chosen as significant others by high and overachievers more often than they were chosen by low and underachievers. A Chi square analysis indicated that this difference was significant at the .05 level. These results must be accepted with some degree of caution as no evidence for reliability or validity of the experimental scales has yet been reported.

The criticism just made of the Brookover study is not applicable to the research reported by Davidson and Lang.[1] The extensive pre-testing

[1]Helen H. Davidson & G. Lang, "Children's Perceptions of Their Teacher's Feelings Toward Them Related to Self-Perception, School Achievement and Behavior", Journal of Experimental Education, 1960, Vol. 29, pp. 107-118

of their experimental instruments is to be commended. The results may be summarized as follows: 1) a significantly positive relationship between favorable perception of teachers' feelings toward the student and academic achievement was found, 2) children who had a more favorable

Table 2.3

Summary of Correlations Among "Self Concept of Ability" Scores; Grade Point Average; and "Importance of Grades" Scores for Males (N=513) and Females (N=537) (Brookover et. al.)

	Males	Females
Self Concept and GPA	.555	.548
Self Concept and Importance of Grades	.456	.334
GPA and Importance of Grades	.237	.006
Self Concept and GPA with Importance of Grades Partialed	.517	.559

or a more adequate self-concept, i.e. those who achieved a higher self-perception score, also perceived their teachers' feelings toward them more favorably, and 3) favorable perception of teachers' feelings was associated with desirable classroom behavior. The results are interpreted as indicating that when the teacher's feelings of acceptance and approval are communicated to the child, these are perceived as positive appraisal by the child. The perceived positive appraisals stimulate the child to seek further teacher approval by achieving well and demonstrating acceptable classroom behavior. The interrelationships among self-perception, perception of teacher approval, and academic achievement has been demonstrated. However, these findings should not be inter-

preted as indicating cause and effect relationships. Also, it is noted that the sample was limited to those students who were the better known readers, the poor readers being eliminated. Such a sampling procedure would result in higher homogeniety among subjects, and therefore more conservative estimates of possible differences. Although important relationships were demonstrated in this study, the lack of meaningful statements about the psychological dimensions of self-perceptions is evident.

An investigation by Shaw, Edson and Bell attempted to overcome the short-coming described above.[1] Using the Sarbin 200 word adjective check-list, significant differences were found in the self-concepts of achievers and underachievers, for each sex, with intelligence controlled. Thirteen adjectives were significant discriminators at the .05 level for males, e.g. stable, reliable, intelligence, and mischievous. Seventeen adjectives were significant discriminators at the .05 level for females, e.g. ambitious, pleasure-seeking, moody, and easy-going.

The authors drew the following conclusions from their findings; 1) male underachievers seem to have more negative feelings about themselves than do male achievers, and 2) female underachievers tend to be ambivalent in their feelings toward themselves.

No evidence has been presented to demonstrate whether differences in the self-concepts of students manifesting achievement extremes, is a cause of or a result of their scholastic experiences.

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[1]Merville C. Shaw, K. Edson, & H. M. Bell, "The Self-Concept of Bright Underachieving High School Students as Revealed by an Adjective Check List", Personnel and Guidance Journal, 1960, Vol. 39, pp. 193-196

The three studies just reviewed gain significance in light of the research findings of several other investigations. A study by Stevens determined that the saliency of self-concept is its most important characteristic .[1] In studying a group of successful and unsuccessful college students Stevens found that significant differences existed between these groups in terms of the salience, or distinctiveness, of the characteristics that they attach to their own personalities. Self-characteristics that involve energy, productivity and efficiency were more highly valued by the academically successful student than the unsuccessful student. It was also found that self-insight and self-acceptance was greater in the academically successful student. This was especially true when such students evaluated their own intellectual abilities. It was suggested that the poorer self-evaluation of the unsuccessful students, which was reflected in a distorted self-picture of their intellectual ability, had been due to defense mechanisms used to compensate for academic failure. The influence of defensiveness is further clarified by Roth.[2] In studying college students enrolled in reading improvement courses, Roth found significant differences between the self-perceptions of three groups; 1) drop-outs, 2) improvers, and 3) non-improvers. The differences took the form of general defen-

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[1]Peter H. Stevens, An Investigation of the Relationship Between Certain Aspects of Self-Concept and Students Academic Achievement, Doctoral Dissertation, New York University, 1956

[2]R. M. Roth, "Role of Self-Concept in Achievement", Journal of Experimental Education, 1959, Vol. 27, pp. 265-281

siveness, distortion of perceived self and self as seen in relation to authority, and self as a reader. Drop outs were found to be most defensive in respect to learning, the improvers least defensive. The investigators did not control for continuity of testing at the time the self-concept measures were obtained. This fact might significantly have affected the results.

An pertinent study reported by Passow and Goldberg focalizes the significance of self-acceptance scores.[1] Before considering the results of the study two serious methological shortcomings should be noted. The problems are 1) a compounded sampling procedure by selecting criterion groups from different grades within the high school with each representing a different achievement classification, and 2) a lack of control for sex. It was found that the total self-acceptance scores of underachievers were somewhat lower than those of high achievers. The most consistently differentiating characteristics were those of high achievers, of an intellectual or task-oriented nature, i.e. underachievers felt they were less capable of successfully performing in these types of activities. No significant differences were found on personal-social traits or on special talents and aptitudes. Although the underachievers viewed themselves as less adequate in intellective and task related behavior, their expressed "wishes" in these areas were not different from the high achievers. Thus, the psychological distance which the underachiever

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[1]A. Harry Passow & M. L. Goldberg, The Talented Youth Project: A Progress Report 1961, New York: Horace Mann-Lincoln Institute of School Experimentation, Teachers College, Columbia University, (Mimeographed)

must travel to attain his desired status is far greater than the gap confronting the high achiever. The underachiever is faced with a psychological task which he may perceive as being beyond his efforts to accomplish and consequently either lowers his aspirations to the point where he is satisfied with "just getting by" or searches for some fantasy device which will enable him to achieve his goal. He may also completely divorce himself psychologically from the academic aspect of school, and obtain his self-satisfactions in non-academic areas.

An investigation which summarized the types of relationships that have been discussed in this section, is that of Reeder.[1] Using pupil self-ratings corroborated by teacher and peer ratings of middle grade children, and a comparison of two groups matched on intelligence test scores, but having extremes of self-concept, Reeder found that children with low self-concept scores had; 1) school achievement lower than expected based on a given level of "potential", and 2) frequently were classified as having classroom behavior problems.

An interesting trend emerges from the preceeding review of literature relating self-concept to achievement, namely sex differences.

Sex Differences in Self-Concept

Aside from the sex differences already noted in the studies by

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[1]Thelma A. Reader, A Study of Some Relationships Between Level of Self-Concept, Academic Achievement, and Classroom Adjustment, Doctoral Dissertation, North Texas State College, 1955, Dissertation Abstracts, 1955, Vol. 15, p. 2472

Brookover et.al.[1] and Shaw et.al.,[2] several other investigators have demonstrated that significant differences exist in analyses of the responses of males and females to measures of self-concept.

Sarbin and Rosenberg,[3] using a modified Gough Adjective Check List, found in studying a normal college population, that men exceeded women in checking such adjectives as resourceful, mature, logical, adventurous, realistic, deliberate and efficient. Women exceed men in checking feminine, emotional, affectionate, pleasant and temperamental. However, the groups were not specified as being equal in size and the greater response total of the men was not controlled in the statistical analysis. Perkins also found sex differences in self-ideal congurence in favor of females in a study with elementary school children.[4] Davidson and Lang, again in studying elementary school children, found that sex differences existed in their subjects' "looking-glass" self-concept.[5] The females perceived their teacher's

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[1]Wilbur B. Brookover, A. Velinsky & S. Thomas, "Relationship of Self-Images to Achievement in Junior High School", Paper read at Annual Meeting of American Educational Research Association, Chicago, February, 1961

[2]Merville C. Shaw, K. Edson & H. M. Bell, "The Self-Concept of Bright Underachieving High School Students", Personnel and Guidance Journal 1960, Vol. 39, pp. 193-196

[3]T. R. Sarbin & B. G. Rosenberg, "Contributions to Role-Taking Theory: IV. A Method for Obtaining a Qualitative Estimate of Self", Journal of Social Psychology, 1955, Vol. 42, pp. 71-81

[4]H. V. Perkins, "Factors Influencing Change in Children's Self-Concepts", Child Development, 1958, Vol. 29, pp. 221-230

[5]Helen H. Davidson & G. Lang, "Children's Perceptions of Their Teachers' Feelings Toward Them Related to Self-Perception School Achievement and Behavior", Journal of Experimental Education, 1960 Vol. 29, pp. 107-118

feelings toward them as being more favorable than did the males ($Mean_f$ = 2.60, $Mean_m$ = 2.52, t=2.41, $p < .02$). In two studies by Rosen,[1,2] using college subjects, sex differences were found in self appraisal. The weight of evidence in the literature supports a hypothesized difference in the self-concepts of males and females. This is particularly true if the self-concept measures are further related to academic achievement. In this situation, however, the differences might have been due to initial sex differences in achievement.

Self-Concept Related to Motivation and Level of Aspiration Behavior

Academic performance may be viewed as a function of ability and motivation. Evaluations of research studies which have attempted to relate self-concept and academic performance have been presented earlier in this review. Evidence has been presented elsewhere that motivation and academic performance are related.[3] It would seem logical, then, to posit a relationship between self-concept and motivation. Only in one published study was an attempted to test such a relationship. This might be explained in part by the lack of reliable and valid measures of motivation. The one study which was uncovered, however, has particular relevance for the purpose of this review. Martire obtained thematic

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[1]E. Rosen, "Self-Appraisal and Perceived Desirability of MMPI Traits", Journal of Counseling Psychology, 1956, Vol. 3, pp. 44-51

[2]E. Rosen, "Self-Appraisal, Personal Desirability and Perceived Social Desirability of Personality Traits", Journal of Abnormal and Social Psychology, 1956, Vol. 52, pp. 151-158

[3]Marion D. Thorpe, The Factored Dimensions of an Objective Inventory of Academic Motivation Based on Eleventh Grade Male Over- and Under Achievers, Doctoral Dissertation, Michigan State University, 1961

apperception measures of achievement motivation (n-Achievement) from 53 male college students under both "neutral" and "achievement-motivating" instructions.[1] Self-Ideal and Self measures were obtained by having students rank 26 traits according to their importance in general, and again in terms of how characteristic of them each trait was. Wishful and realistic levels of aspiration were obtained for a specific pencil and paper task. In general it was found that individuals with high motivation scores under both instructive conditions had a significantly greater discrepancy between their self-ideal and self ratings on five achievement-rated traits. It was also found that self-concept and level of aspiration measures were related to achievement motivation, but not to each other. A logical interpretation of this finding would lead to the conclusion that measures of these two variables are each concerned with some distinct and independent aspect of an individuals "achievement syndrome". A related study is that of Pyne.[2] In this study, conducted at the University of Minnesota, Pyne demonstrated that successful and unsuccessful competitors could be distinguished on the basis of their self-concept, level of aspiration, and motivation as measured in terms of observable behavior.

Several investigators have limited their research to studying only relationships between self-concept and level of aspiration. Level

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[1]John G. Martire, "Relationships Between the Self-Concept and Differences in the Strength and Generality of Achievement Motivation", Journal of Personality, 1956, Vol. 24, pp. 364-375

[2]Francis F. Pyne, The Relationship of Measures of Self-Concept, Motivation and Ability to Success in Competitive Athletics, Doctoral Dissertation, University of Minnesota, 1956, Dissertation Abstracts, 1957, Vol. 17, p. 559

of aspiration was defined as a standard by which a person judges his own performance as a success or a failure, or as being up to what he expects of himself.[1]

Gilinsky has demonstrated a positive relationship between self-concept and level of aspiration ($r = +.67$).[2] No information, however, was available to indicate what cognitive and/or emotional variables were involved in producing the relationship.

A similar finding is reported by Sears.[3] She found an association between size of positive discrepancy score in an experimental level of aspiration task and the size of stated (self-self ideal) discrepancies on academic tasks. The "reality dimension" was held constant across subjects, so the discrepancy scores were a function of individuals differences in stated level of aspiration. It could not be determined from the data whether the high (self-self ideal) discrepancies were due to statements of unusually high ideals, low realistic self, or both. In this study, level of aspiration was operationally defined as "goal setting behavior". The same definition was used in a study by Steiner in studying college students by using a measure of various self-perception ratings.[4] Steiner concluded that persons with uncertain self-

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[1]Horace B. English & A. C. English, A Comprehensive Dictionary of Psychological and Psychoanalytical Terms, New York: Longmans, 1958

[2]A. S. Gilinsky, "Relative Self-Estimate and the Level of Aspiration", Journal of Experimental Psychology, 1949, Vol. 39, pp. 256-259

[3]Pauline Sears, "Level of Aspiration in Relation to Some Variables of Personality", Journal of Social Psychology, 1941, Vol. 14, pp. 311-336

[4]I. D. Steiner, "Self Perceptions and Goal Setting Behavior", Journal of Personality, 1957, Vol. 25, pp. 344-355

perceptions tend to set goals which are high relative to their past performance. They expect their performance scores to vary considerably over time, and are more likely, than a "certain" group, to over-estimate their future performance. They are less certain than others that their goals are realistic. Persons pessimistic in self-appraisal stated that they felt because they were pessimistic, this in some way affected their performance. This later group was also intropunitive in their explanations of their performance. Steiner often used terms which held unique meaning for him. This fact in combination with the elaborate measurement procedure, which was susceptible to faking and malingering on the part of subjects, casts some serious doubt on the research results. Despite the indicated short-comings in the studies reviewed in this section, some support for posited relationships between self-concept and level of aspiration is present.

Conclusions and Interpretation

Although few definitive studies have been made in the area of self-concept, there are sufficient positive findings to support further use of self-concept theory as a research base. The paucity of research is even more evident when searching for investigations which have attempted to relate aspects of self-concept to an achievement setting. Self-concept does appear to be related to academic achievement, motivation, and level of aspiration. To date, indications are that under- and overachieving students differ significantly on these last three variables. Therefore, it is logical to assume that statistically defined discrepant achievers would differ in self-concept. This would be

particularly true if the self-concept is academically referent. There is also research evidence to justify an analysis of academic self-concept separately for males and females. A need exists to identify the dimensions of self-concept which are related to academic achievement.

Summary

In the review of related research presented in this chapter, a discussion of various theoretical orientations of the psychology of the self was made. Following from this discussion, definitions of self-concept and academic self-concept were presented. The types of and problems in, the measurement of self-concept were next discussed, followed by a review of studies in which the primary concern was to discover the underlying structures or dimensions of self-concept. These dimensions were summarized as follows; intelligence, emotions, body image, and motivation. Evidence was offered in support of hypothesized relationships between self-concept, and academic achievement, motivation, and level of aspiration behavior. Sex differences in self-concept were noted. For example, male underachievers tend to have a negative and pessimistic self-concept, whereas female underachievers are ambivalent about their feelings toward themselves. As a total group, females had more positive self-concepts than did males. Finally, a discussion of the research implications of the total review was presented.

CHAPTER III

DESIGN AND METHODOLOGY

Considerations of the general design and methodology of this study are made under five general headings; 1) instrumentation, 2) sample selection, 3) item analysis procedures, 4) selection of appropriate multivariate model, and 5) multiple scalogram analysis procedures.

Instrumentation

An instrument was designed and constructed which required the student to respond to a series of concepts. These concepts were assumed to be related to both the student's self-concept and academic achievement. The student was to respond to these concepts as he thought his teachers would, when viewing his as a student.

Items for the construction of an instrument to measure academic self-concept were developed from information drawn from three primary sources; 1) the academic self-concept theory developed in Chapter I, 2) the review of related self-concept literature found in Chapter II, and 3) summary personality, motivational, intellectual, and emotional characteristics, which had been used by the Farquhar team for over-all item development in the Motivational Project. (See Appendix A)

Items were developed in the form of one, two, or three word concepts and phrases. Some of the concepts were developed as "slang" expressions frequently used by adolescents.

The resulting instrument consisted of 119 concepts. The student was asked to rate each of these concepts on a four point scale as he thought his teachers would. The rating scale used was as follows;

1=never, 2=sometimes, 3=usually, and 4=always. This format was used to bring into play the "looking-glass-self" theory discussed in Chapter I.

Responses to the instrument, labled the Word Rating List (hereafter referred to as WRL[1]), were obtained on IBM answer sheets to facilitate data analysis. The WRL was administered to eleventh grade under- and overachieving students of each sex, hypothesizing that these individuals would differ significantly in their academic self-concepts. The procedure for the selection of statistically defined under- and overachieving students is outlined in the following section.

Sample Selection

Validation and cross-validation of the Word Rating List was accomplished by contrasting under- and overachieving students who were identified in the following manner:

1) A survey of high schools in the 100 largest populated cities was made to determine the nature of their testing programs.
2) Nine high schools in eight Michigan cities having 9th grade Differential Aptitude Test scores available on their current 10th graders, were contacted and asked to co-operate in the study.
3) A second aptitude measure was obtained so that reliable estimates of academic aptitude could be made. California Tests of Mental Maturity were administered while the students were in the 10th grade. Administration was necessary in all but one of the schools.

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1 A copy of the Word Rating List is to be found in Appendix B.

4) Grade point averages (GPA) were calculated using grades in 9th and 10th grade subjects. Only academic subjects were included, i.e. those requiring homework. Activity courses were eliminated from the calculations.

5) The DAT-Verbal Reasoning and CTMM-Language sub-test scores were used in obtaining a stable estimate of academic aptitude after empirically examining possible DAT and CTMM sub-score combinations.

6) Regression lines were calculated for each school and sex assuming a correlation of +1.00 between DAT-VR and CTMM-L. Separate equations were calculated because a pilot study indicated that one was not applicable across schools. Only those individuals who fell within one standard of error of estimate above and below the regression line were included in the study. Because it was important that the criterion groups be classified with little chance of making a Type II error (accepting when should have rejected), it was decided to run the risk of a Type I error (reject when should have accepted)even if sample were lost in the process. (see Figure 3.1)

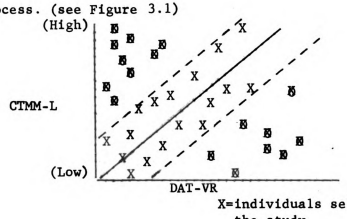

Figure 3.1 Methodological Selection of Individuals with Stable Measured Aptitude

7) Regression equations predicting GPA from the DAT-VR scores were calculated for each sex in each of the participating schools. The DAT-VR was used as the dependent variable because it was found to correlate consistently higher with GPA than the CTMM-L scores. (e.g. in one pilot study the correlation of VR with GPA was found to be +.65, and CTMM-L with GPA to be +.50) Underachievers were defined as those individuals whose GPA fell at least one standard error of estimate <u>below</u> the regression line prediction of achievement. Similarly overachievers were designated as falling one standard error of estimate <u>above</u> the regression line. (see Figure 3.2)

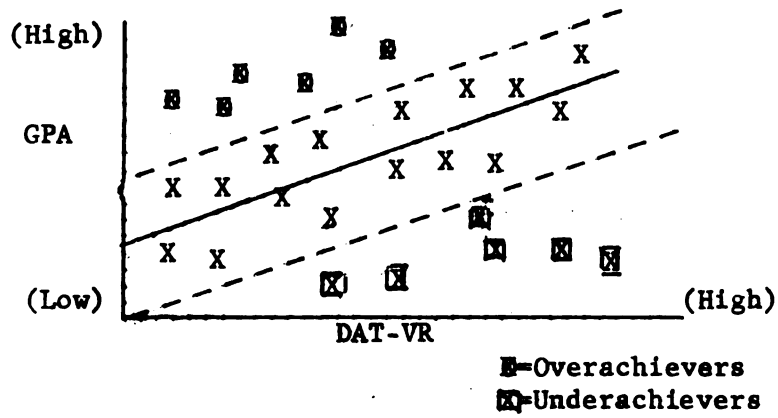

Figure 3.2 Method of Selecting Under- and Overachievers

By using the above indicated method, under- and overachieving students were selected from the full range of academic ability. Approximately 12% of the sample was classified in one of the extreme groups.

This procedure resulted in obtaining 167 male overachievers, 131 male underachievers, 191 female overachievers, and 170 female underachievers, on whom WRL results were available. Each of these four groups was divided in half, the first becoming the validation sample

and the second, the cross-validation sample. A summary of the resulting sample sizes is presented in Table 3.1.

Table 3.1

Summary of Sample Sizes Used in Validation and Cross Validation of the Word Rating List*

		Overachievers	Underachivers
MALES	Validation	87	62
	Cross-Validation	80	69
	Total	167	131
FEMALES	Validation	95	84
	Cross-Validation	96	86
	Total	191	170

*Drawn from an original sample of 4200 eleventh grade students

Item Analysis Procedures

The four point response continum of the WRL was dichotomized to facilitate the tabulations and calculations necessary for item analysis. Responses of "1" and "2" became "0", and responses of "3" and "4" became "1". The "0" scoring direction indicating that the student felt his teachers would not use a particular concept in describing him, and the "1" response indicating that he felt that his teachers would use a particular concept in describing him. Response frequencies for every item were obtained. These frequencies were then entered into a 2X2 contingency table (under- and overachievement by "0" and "1"), and the

Chi square values determined.[1] This analysis took the form of finding which items significantly discriminated between under- and overachievers. The level of significance was set at .10 for the validation and cross-validation of the WRL. The stringent significance level was used in order to minimize rejecting the null hypothesis when it should have been accepted (Type I error).

Selection of Appropriate Multivariate Model

Several multivariate analytic procedures are available for the determination of underlying structure for a given set of data. A recent study by Lingoes presents empirical results to aid in the selection of an appropriate procedure.[2] In this investigation a hypothetical binary response matrix (dichotomous responses) of Congressional voting behavior was analyzed using 1) multiple scalogram analysis,[3] 2) Guttman's scalogram analysis, as discussed by Stouffer,[4] 3) multiple factor analysis

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[1]This analysis was accomplished on a high speed electronic computer (MISTIC) at Michigan State University, by having the observed frequencies for Chi square analysis punched on computer tape and analyzed with the K6M program.

[2]James C. Lingoes, "Multiple Scalogram Analysis: A Generalization of Guttman's Scale Analysis", Doctoral Dissertation, Michigan State University, 1960

[3]James C. Lingoes, "Multiple Scalogram Analysis-----"

[4]S. A. Stouffer (Ed.), Measurement and Prediction, Princeton: Princeton University Press, 1950

(principle axes extraction[1] and quartimax rotation[2]), and 4) Loevinger's method of homogeneous tests. The purpose of this study was to discover the underlying dimensions of the response matrix, such that the whole matrix could be perfectly reconstructed on the basis of ranked scores. The analysis results were validated and cross-validated for each of the analytic procedures. Multiple scalogram analysis was found to be the only technique among the four which could directly, simply, objectively, uniquely, and parsimoniously accomplish the aim as proposed. Loevinger's technique was found to be second in meeting the criteria. On the basis of this research it was decided to use multiple scalogram analysis procedures to determine the underlying dimensions of the response matrix obtained from eleventh grade students on a measure of academic self-concept. A description of multiple scalogram analysis is presented in the following section.

Multiple Scalogram Analysis Procedures

A generalization of Guttman's scaling method has been presented for dichotomous data by Lingoes.[3] This method, multiple scalogram analysis (MSA), is designed to yield a number of unidimensional scales in a single analysis.

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[1]J. O. Neuhaus and C. F. Wrigley, "The Quartimax Method: An Approach to Orthogonal Simple Structure", British Journal of Statistical Psychology, 1954, Vol. 7, pp 81-91.

[2]Jane Loevinger, "The Technique of Homogeneous Tests Compared With Some Aspects of "Scale Analysis" and Factor Analysis", Psychological Bulletin, 1948, Vol. 45, pp. 507-529

[3]James C. Lingoes, Multiple Scalogram Analysis: A Generalization of Guttman's Scale Analysis , Doctoral Dissertation, Michigan State University, 1960.

Items are said to be perfectly scaleable or to constitute a unidimensional scale if and only if the same response pattern is given by any to S's having the same score. Stated in another way: a unidimensional scale exists if one is able to reproduce each S's responses pattern on the basis of each S's score and a knowledge of the item ordering. In a broad sense, the reproducibility of a scale is its reliability. Furthermore, for any S having a higher score than another S, it is true that the higher ranking S ranks as high or higher than the lower ranking S on every item in the set, i.e., passes or endorses these items.

Multiple scalogram analysis is an objective and empirical technique for partitioning a dichotomous response matrix into a number of sub-matrices, such that each sub-matrix tends to be maximally homogenous. The method is founded on the premise that there must exist some formal criteria for item selection as an alternative to the subjectivism implicit in Guttman's concept of a "universe of content or attributes".

Advantages of MSA

The chief advantages of MSA are as follows:

1) It allows for a wider latitude in complexity of the items included for analysis, e.g. personality items as broadly defined rather than some specific personality variable. In effect, the data are permitted to "speak for themselves", without imposing restrictions in advance of exploring the underlying structure of a given set of data.

2) It is a unique solution for the data.

3) It is economic in terms of time and effort.

4) If the assumptions of a scale model underlie the data, the results of MSA will clearly indicate the existance of a scale or scales. This is true only if such a scale exists, as opposed to factor analysis which yields factors even if only chance relationships are present.

5) A clear picture not only of what scale or scales exist, but where each individual fits on the scale is presented.

6) MSA is able to handle a number of items and subjects limited only by the capacity of the computer being used.

One limitation of the MSA program at present is that it will handle only dichotomous data. In relation to the present data this is not considered a limitation because of its dichotomous nature.

Criteria for Homogenity of Sub-Matrices

Homogenity of sub-matrices (sub-scales or dimensions) resulting from MSA is achieved by three formal criteria:

1) Each set or group of responses to each item is maximally related to items or sets which are adjacent to it by the use of a set-measure rather than conventional measures of correlation.

2) Each item is allowed to contribute only its proportional share of error to the sub-matrix of items and people, where error is defined in terms of deviations from perfect reproduction of the sub-matrix.

3) Each person is similarly permitted to contribute only a certain percentage of error to the sub-matrix. This is accomplished by eliminating S's from the response matrix when their response patterns fall below a given critical value as determined by an iterative procedure.

Criteria 2 and 3 above have implications for the determination of reliability of the resulting dimensions. This fact will be discussed in another section of this chapter.

Assumptions of MSA Model

The major assumptions underlying the multiple scalogram model are as follows:

1) The items being analyzed either are or can be made to conform to the characteristics of cumulative items.
2) Item direction for a particular sub-matrix has not been determined on an a priori basis.
3) The items being analyzed are simple, equipotent, and additive. Furthermore they are invariant in validity and meaning for a given sample of subjects and items.
4) Prediction, understanding, and psychological meaningfulness of resulting sub-matrices will result to the extent to which constancy does not exist across items and/or people in terms of observed relationships.
5) The error for subjects is reliable within the same domain of subject matter or content.
6) The response matrix to be analyzed is based on a dichotomous response measurement.

The data of this study meet the above assumptions for the following reasons:

1) The rating scale used in the Word Rating List can be justified as meeting the requirements of an interval scale which allows for additivity and cumulation.
2) The dimensions of the response matrix have not been determined on an a priori basis.
3) The response continum has been dichotomized.
4) The assumption of equipotency and invariance of validity is met due to the fact that all items to be analyzed must have reached or exceeded the .10 level of significance for discrimination.
5) All item-word-concepts are assumed to be measures of the same broad content area of academic self-concept.
6) Individuals within a particular achievement classification (under- or overachievement) are assumed to be homogenious and stable. Some indication of the stability of at least one of the achievement classifications over time, namely underachievement, is presented by Shaw and McCuen.[1] They found that that their underachievement classifications of both males and females had stabilized by the tenth grade, after following these individuals from the first grade.

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[1]Merville C. Shaw and J. T. McCuen, "The Onset of Academic Underachievement in Bright Children", Journal of Educational Psychology, 1960, Vol. 51, pp. 103-108.

Reproducibility (Reliability) of Sub-Matrices

Reproducibilities of the resulting dimensions from multiple scalogram analysis correspond to the value: $R = 1 - \frac{\Sigma(\text{errors})}{mn}$, where m= the number of items in the sub-matrix, n= the number of subjects, and errors are counted as deviations from the predicted response pattern.[1] Before the data is fed into the computer, a parameter is read in which indicates a predetermined error level for allowable percentage of variation of items by subjects, i.e. deviation from perfect scalability. In the world of reality, perfect scales are almost never found, but reproducibilities around .90 are considered as being close approximations. If the 10% criterion for scalibility is used, the resulting reproducibilities will range from .90 to .70,if the 20% criterion is used, the range will be from .80 to .60.[2]

Procedural Steps in MSA

A comprehensive discussion of the actual procedural steps in multiple scalogram analysis is presented by Lingoes.[3] Several of these steps should be discussed as they are unique to the data of the present study.

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[1]W. H. Goodenough, "A Technique for Scale Analysis", Educational and Psychological Measurement, 1944, Vol. 4, pp. 179-190.

[2]Donald M. Wilkins, Statistician in the Computer Laboratory, Michigan State University, personal communication

[3]James C. Lingoes, Multiple Scalogram Analysis: A Generalization of Guttman's Scale Analysis, Doctoral Dissertation, Michigan State University, 1960, pp. 13-18.

1) Multiple scalogram analysis was carried out only on those items which had met the .10 significance level criterion set for cross-validation.

2) Following from the discussion of sex differences in self-concept as presented in Chapter II, separate analyses were completed for males and females.

3) In order to maximize the dimensions to be obtained from MSA, under- and overachievers were combined within each sex. Due to computer limitations, 49 females had to be randomly eliminated, with the resulting sample sizes for MSA as follows, Males = 298 and Females = 312.

4) For each of the cross-validated items, a dichotomous response matrix (using "0's" and "1's"), was built for males (combined under- and overachievers) and females (under- and over-achievers).

5) These response matrices for each item by sex were punched into item cards and fed into MISTIC, the high speed electronic computer at Michigan State University, and the multiple scalogram analysis completed.[1]

6) Multiple scalogram analysis will be completed using the 10% criterion for scalibility. If all dimensions do not meet this criterion the error level will be moved to 20%. This latter step will still allow for dimension reliability of .80. If the resulting dimensions from the second analysis do not meet the criterion, analysis will be terminated, it being assumed that reliable dimensions are not present.

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[1]MISTIC Library Routine for MSA is K9M

Summary

A discussion of the development of an experimental instrument to measure academic self-concept has been presented. This instrument was labeled the Word Rating List. In order to validate and cross-validate the instrument, criterion groups of under-and overachieving eleventh grade students were selected for each sex. It was assumed that such discrepent achievers would differ significantly in their academic self-concepts. Chi square analysis procedures were presented. To determine the psychological meaningfulness of an inventory of academic self-concept, it was felt that a multivariate analysis was necessary; the specific purpose being to determine the underlying dimensions of such an inventory. A review of the research literature indicated that multiple scalogram analysis would best meet this purpose. The nature of, assumptions necessary for, and procedural steps involved in this analytic method were discussed.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

In this chapter the data pertaining to each of the major and minor hypotheses described in Chapter I will be presented. Following each data presentation will be an interpretation of the analysis as it relates to the hypothesis.

Item Analysis Results

Major Hypothesis I concerned with the question of whether or not significant differences exist between under- and overachieving students on a measure of academic self-concept. The tests of significant differences on such a measure, were determined by Chi square analyses. A summary of the item analyses for the Word Rating List, is presented in Table 4.1.

TABLE 4.1

Summary of Item Analyses of the Word Rating List*

		Chi Square Significance Level			
		.10	.05	.01	Total
Validation	Males	11	19	37	67
	Females	10	27	50	87
Cross-Validation	Males	4	8	36	48
	Females	7	7	34	48

*Originally 119 items.

Inspection of Table 4.1 indicates that 40% of the original 119 items

held up after cross-validation, for each sex. It is also noted that 75% of the male items and 71% of the female items were significant discriminators at the .01 level. It must be remembered that the items were required to meet the .10 discrimination criterion in both validation and cross-validation to be acceptable for the final scale. All of the above strongly support the hypothesis of significant differences between under- and overachieving students on a measure of academic self-concept.

Minor Hypothesis I was concerned with sex differences in academic self-concept. It was found that of the 48 discriminating items, 35 or 73% were in common to both sexes.[1] It was also found that all of the items in common to both sexes were significant discriminators in the same scoring direction. All of the findings thus far presented, give evidence for the rejection of the hypothesis of sex differences in academic self-concept. More data concerning this hypothesis will be available when the results of the dimension analyses are presented. Such results will indicate to what extent the 13 unique items influence the resulting dimensions.

A summary of the reliability estimates for the total scale scores, for the cross-validated items, are presented in Table 4.2. The estimates, obtained by Hoyt's method,[2] are for underachievers, overachievers, a random sample of the general population, and a sample of

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[1]The discriminating items for males and females are indicated on the copy of the Word Rating List found in Appendix B.

[2]Cyril J. Hoyt, "Test Reliability Estimated by Analysis of Variance", Psychometrika, 1941, Vol. 6, pp. 153-160.

combined under- and overachievers. An evaluation of Table 4.2 indicates

TABLE 4.2

Summary of Hoyt's Reliability Estimates on The Word Rating List for Different Samples by Sex

		N	Reliability Estimate
MALES			
	Random Sample	66	.92
	Overachievers	50	.92
	Underachievers	50	.91
	Combined Under- and Overachievers	100	.93
FEMALES			
	Random Sample	66	.90
	Overachievers	50	.90
	Underachievers	50	.88
	Combined Under- and Overachievers	100	.93

that all reliability estimates are of an acceptable magnitude. The reliability estimates obtained on the samples of combined under- and overachievers are of crucial importance, as these groups constituted the samples used in the multiple scalogram analyses. The reliabilities of the total WRL scores for these samples are also of an acceptable magnitude.

Multiple Scalogram Analyses

The results of the multiple scalogram analyses will be considered in two sections, the first for males, the second for females. The primary purpose of this study was not to develop a measure of academic self-concept which was scalable, but to determine the underlying structure, or dimensions of academic self-concept, with a view toward

expansion and/or modification of the academic self-concept theory presented in Chapter I. Primary concern, then, will not be with meeting the "scale-type" criteria which have been suggested by Guttman,[1] and Edwards.[2] To increase the interpretablity of the analyses, the following points should be considered:

1) The reproducibility of a dimension is a measure of the degree of accuracy with which the item responses can be duplicated from knowledge of the total scores alone. The coefficient of reproducibility is calculated by the method described by Goodenough.[3]

2) The minimal marginal reproducibility of a dimension (an average of the modal response proportions), when compared with the reproducibility indicates the improvement in predictions of response patterns from the knowledge of total scores.

3) Sometimes the modal response proportion for "q" is greater than "p", i.e. a greater percentage of people responded in the direction opposite than that which was indicated. When this occurs, the particular item is "reflected" and is interpreted in the direction opposite from the scored direction.

4) Multiple scalogram analysis yields information not only about the grouping of items, but also about the ranking or placement of individuals. Therefore, the individuals who primarily determine the

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[1]Louis Guttman, "The Basis for Scalogram Analysis", In S. A. Stouffer, et. al, Measurement and Prediction, Princeton: Princeton University Press, 1950, pp. 60-90.

[2]Allen L. Edwards, Techniques of Attitude Scale Construction, New York: Appleton-Century-Crofts, 1957, pp. 172-200.

[3]W. H. Goodenough, "A Technique for Scale Analysis", Educational and Psychological Measurement, 1944, Vol. 4, pp. 179-190.

nature of a particular dimension may be characterized by the item content of the dimension they have determined. Such a fact aids in the interpretation of dimensions because it allows for characterization of individuals and thereby their academic self-concepts.

Results of Multiple Scalogram Analysis - Males

The first analysis, using the multiple scalogram program with an error level of .90 (allowing for reproducibilities between .90 and .70), for combined male under- and overachievers did not yield sufficient dimensions for psychological interpretation. The error level was therefore moved to .20 (allowing for reproducibilities between .80 and .70) and a second analysis completed. This analysis yielded four dimensions which accounted for 46 of the 48 cross-validated male items. Only items eight (confident) and 89 (contented) did not scale on any of the dimensions. The item content of the four dimensions is presented in Tables 4.3, 4.4, 4.5, and 4.6. Following each of these tables is a brief description of the dimension. A more comprehensive interpretation of the dimensions will be presented in Chapter V.

A content evaluation of Dimension I as presented in Table 4.3 indicates that this is a general or global dimension of academic self-concept. Dimension I contains 54% of the scaled items for males.

Dimension I also characterizes the individual who seeks academic achievement by using the usual academically sanctioned means, e.g. by being interested, ambitious, careful, orderly and intelligent in his classroom behavior. This is the type of individual who wishes to learn what is presented in class because he knows he must do so in order to obtain an acceptable grade. He is the type of individual who

TABLE 4.3

Item Content of Dimension I (Males)
Reproducibility = .786 Minimimal Marginal Reproducibility = .715

Item No.	Scoring Direction*	Item Content**	Modal Response Proportion***
4	-	Inefficient (efficient)	.869
19	-	Uninterested (interested)	.859
45	-	Reckless (careful)	.852
54	-	Stubborn (flexible)	.829
53	-	Lazy (ambitious)	.839
39	-	Rebellious (conforming)	.826
106	-	Impatient (patient)	.819
50	-	A Person Who Postpones (A Person Who Does Things Immediately)	.789
40	-	Nervous (calm)	.842
113	-	Passive (active)	.829
102	-	Inconsistent (consistent)	.819
103	+	Teachable	.732
118	+	Reliable	.748
48	+	Dependable	.752
29	+	Responsible	.705
17	+	Orderly	.641
16	+	Thorough	.550
83	+	A Thinker	.581
85	+	Ambitious	.621
97	+	An Achiever	.560
77	+	Productive	.554
76	+	Above Average	.507
12	+	Smart	.507
13	+	Successful	.587
34	+	Intelligent	.651

*Scoring is in overachievement direction
**For items which yielded a negatively scored direction, the positive meaning of the item content is presented in parentheses to aid in comprehension.
***Either "p" or "q" which ever is larger

would fit the teacher's sterotype of the "good" student. His understanding of and interest in the subject matter, however, may tend to be superficial.

Two other trends are apparent from an evaluation of this dimension

First, the modal response proportions for the highest ranking eleven items are for items which are scored in the negative direction. A tentative interpretation might be that the male, particularly the male overachiever, knows best what his self-concept is not like, rather than what it is like. Secondly, the characterization of "ambitious" appears strong on this dimension, because two items, number 53 and 85, were found to scale on this dimension.

TABLE 4.4

Item Content of Dimension II (Males)
Reproducibility = .749 Minimal Marginal Reproducibility = .661

Item No.	Scoring Direction*	Item Content**	Modal Response Proportion***
23	-	Different (not different)	.742
59	-	Carefree (concerned)	.654
117	-	Easily Distracted (not easily distracted)	.688
10	+	Logical	.604
5	+	Practical	.638

*Scoring is in overachievement direction
**For items which yielded a negatively scored direction, the positive meaning of the item content is presented in parentheses to aid in comprehension.
***Either "p" or "q" which ever is larger

An evaluation of Table 4.4, which contains the item content of Dimension II, indicates a description of an individual who responds in a socially acceptable manner in the academic setting. His responses are not motivated by a desire to make academic inquiries, but to impress on his peers and teachers that he is like everyone else, that he conforms to the norm group behavior. He logically determines the practical ramifications of his behavior before he acts or reacts.

TABLE 4.5

Item Content of Dimension III (Males)
Reproducibility = .743 Minimal Marginal Reproducibility = .584

Item No.	Scoring Direction*	Item Content	Modal Response Proportion**
15	+	Careful	.708
1	+	Patient	.658
33	+	Consistent	.644
22	+	Studious	.550
115	+	Efficient	.557
41	+	Systematic	.517
101	+	Competent	.547
52	+	Exacting	.594
67	+	Intellectual	.621
2	+	Talented	.570
32	+	Original	.523
36	+	In-the-know	.527

*Scoring is in the overachievement direction
**Either "p" or "q" which ever is larger

Dimension III, as presented in Table 4.5, describes an individual whose achievement is motivated by a desire to completely understand or to master the subject matter material as presented in class. Although both Dimension I and Dimension II are concerned with obtaining knowledge of subject matter, they differ in the motivations for and the degree to which such knowledge is obtained.

The fourth male dimension in Table 4.6, characterizes an individual who obtains his achievement by meeting his own academic or intellectual needs. He competes with standards which are his own, and which may or may not be those of his teachers or peers.

TABLE 4.6

Item Content of Dimension IV (Males)
Reproducibility = .800 Minimal Marginal Reproducibility = .619

Item No.	Scoring Direction*	Item Content	Modal Response Proportion**
71	+	Alert	.701
119	+	Serious	.658
98	+	A Planner	.523
18	+	Purposeful	.597

*Scoring is in overachievement direction
**Either "p" or "q" which ever is larger

Results of Multiple Scalogram Analysis - Females

As was the case with the males, the second scalogram analysis yielded the most psychologically interpretable dimensions, with the error level set at .20. This analysis yielded five dimensions on which all but one of the 48 cross-validated female items scaled. Only item 85 (ambitious) did not scale for the females. Ambition was a trait which was particularly evident in the male academic self-concept. The five female dimensions present a different picture of the structure of academic self concept than did the male dimensions.

TABLE 4.7

Item Content of Dimension I (Females)

Reproducibility = .811 Minimal Marginal Reproducibility = .758

Item No.	Scoring Direction*	Item Content***	Modal Response Proportion****
50	-	A Person Who Postpones (A Person Who Does Things Immediately)	.907
20	-	A Procrastinator (not a procrastinator)	.888
24	-	Discontented (contented)	.894
106	-	Impatient (patient)	.891
107	+	Friendly	.901
26	-	Flighty (stable)	.888
35	+	Distractable	.846
54	-	Stubborn (flexible)	.878
40	-	Nervous (calm)	.801
104	+	Reasonable	.824
118	+	Reliable	.785
29	+	Responsible	.776
17	+	Orderly	.795
71	+	Alert	.760
103	+	Teachable	.721
115	+	Efficient	.612
34	+	Intelligent	.516
12	+	Smart	.571
76	+	Above Average	.583
77	+	Productive	.612
67	+	Intellectual	.699
52	+	Exacting	.740
55	+	Perfectionistic	.782
2	+	Talented	.705
23	-(R)**	Different	.760
42	-(R)	Daring	.734
59	-(R)	Carefree	.644
117	-(R)	Easily Distracted	.760
5	+(R)	Practical (impractical)	.718

*Scoring is in overachievement direction.

**Items 23, 42, 59 and 117 are negatively scored items which have been "reflected", and are therefore interpreted in their original form. Item 5 is a positively scored item which has been "reflected" and is interpreted negatively.

***For items which yielded a negatively scored direction, the positive meaning of the item content is presented in parentheses to aid in comprehension.

****Either "p" or "q" which ever is larger.

Dimension I for females in Table 4.7, appears as a general or global self-concept factor as did Dimension I for males. Dimension I contains 29 items or 62% of the 47 cross-validated items that scaled on any of the five female dimensions. This dimension seems to describe an individual who conforms to the teacher's wishes. She does what she is told, and does it immediately, and is generally responsive to the demands of her teachers. The teacher's academic standards are the ones in which she is interested. Dimension II, however, presents evidence for the existence of another standard.

TABLE 4.8

Item Content of Dimension II (Females
Reproducibility = .756 Minimal Marginal Reproducibility = .592

Item No.	Scoring Direction*	Item Content	Modal Response Proportion**
96	+	Concerned	.705
56	+	Accepting	.619
16	+	Thorough	.631
18	+	Purposeful	.574
97	+	An Achiever	.519
98	+	A Planner	.561
60	+	Competitive	.593
101	+	Competent	.564
41	+	Systematic	.564

*Scoring is in overachievement direction
**Either "p" or "q" which ever is larger

Dimension II for females might tentatively be labeled socially acceptable competition, or competition via conformity. An individual so labeled, would use the usual academic modes of behavior, but only to the degree to which she was forced to by virtue of peer competition. She is accepting of and competes within the peer value frame of reference.

The last three female dimensions, although their reproducibilities are of an acceptable magnitude, must be interpreted with caution, as only three items scaled on each dimension. This fact might seriously affect the stability of such a dimension.

TABLE 4.9

Item Content of Dimension III (Females)
Reproducibility = .750 Minimal Marginal Reproducibility = .639

Item No.	Scoring Direction*	Item Content**	Modal Response Proportion***
81	+(R)	Persuadeable (not persuadeable)	.696
9	+(R)	Average (not average)	.638
89	+	Contented	.583

*Scoring is in overachievement direction
**Items 81 and 9 had modal response proportions which caused them to "reflect", i.e. "q" was larger, and are therefore interpreted in the negative direction.
***Either "p" or "q" which ever is larger

Dimension III appears to characterize an individual who conceives of herself as being not average and not persuadeable, and therefore not conforming. She is content to be independent and functions in the academic situation accordingly. Female Dimension II is somewhat similar to male Dimension IV.

Table 4.10 the item content of Dimension Iv is presented. The item content of this dimension would tend to characterize an individual who is not competitive with standards of the teachers of her peers, but "plods" along doing what is required of her and no more.

TABLE 4.10

Item Content of Dimension IV (Females)
Reproducibility = .823 Minimal Marginal Reproducibility = .596

Item No.	Scoring Direction*	Item Content	Modal Response Proportion**
10	+	Logical	.638
33	+	Consistent	.609
22	+	Studious	.542

*Scoring is in overachievement direction
**Either "p" or "q" which ever is larger

If the academic requirements and assignments are structured she will consistently attempt to bring them to a logical conclusion.

TABLE 4.11

Item Content of Dimension V (Females)
Reproducibility = .801 Minimal Marginal Reproducibility = .549

Item No.	Scoring Direction*	Item Content	Modal Response Porportion**
119	+	Serious	.628
83	+	A Thinker	.516
13	+	Successful	.503

*Scoring is in overachievement direction
**Either "p" or "q" which ever is larger

The last female dimension is summarized in Table 4.11. This dimension is difficult to distinguish from Dimension IV as both place an emphasis on a basic seriousness of approach to academic studies. Dimension V, however, describes an individual who is successful because she is serious and doesn't present behavior problems in the classroom, which if present, would tend to lower the teachers evaluation of her.

Orthogonality of the Dimensions

An inspection of the item content of the male and female dimensions obtained from multiple scalogram analysis indicates that the interpretability is difficult because of the overlap of certain concept meanings. To determine the orthogonality or independence of the various dimensions, all the dimensions were intercorrelated, obtaining product-moment correlation coefficients. Intercorrelations were calculated for males and females separately using random porportional samples. The results of the intercorrelations of the male dimensions are presented in Table 4.12. One-hundred males were used in these intercorrelations (55 overachievers and 45 underachievers).

TABLE 4.12

Intercorrelations Among Four Male Dimensions Obtained by Multiple Scalogram Analysis*
N=100

		Dimension		
		D_1	D_2	D_3
	D_2	.56		
Dimension	D_3	.84	.46	
	D_4	.75	.31	.68

*Values are positive unless otherwise indicated

The range of the intercorrelations for the male dimensions was from .31 to .84.

The results of intercorrelations of the five female dimensions are summarized in Table 4.13. The sample again contained 100 subjects,

but with 53 overachievers and 47 underachievers.

TABLE 4.13

Intercorrelations Among Five Female Dimensions Obtained by Multiple Scalogram Analysis*
N=100

		Dimension			
		D_1	D_2	D_3	D_4
	D_2	.72			
	D_3	.13	.11		
Dimension	D_4	.69	.67	.17	
	D_5	.61	.67	-.02	.41

*Values are positive unless otherwise indicated.

Summary

The item discrimination and multiple scalogram analyses results of a measure of academic self-concept were presented in this chapter. It was found that 48 items from the original 199 item Word Rating List remained after cross-validation. These items, 35 of which were in common to both sexes, were significant discriminators between statistically defined under- and overachieving eleventh grade students. Estimates of internal consistency reliability ranged from .90 to .93 for males and from .88 to .93 for females in various samples. Multiple scalogram analyses yielded four male dimensions and five female dimensions which accounted for 96% and 98% of the cross-validated items respectively. The four male dimensions had average reproducilities of .77 and average minimal marginal of .64. The five female dimensions had average

reproducibilities of .80, and average minimal marginal reproducibilities of .63. Descriptions of these nine dimensions were presented, together with the interdimension correlations for each sex.

The interpretations, discussion, and labeling of the obtained dimensions of academic self-concept will be presented in the next chapter.

CHAPTER V

INTERPRETATION AND DISCUSSION OF DIMENSIONS

The dimensions of academic self-concept reported in the previous chapter, to have theoretical or practical usefulness, must be made psychologically interpretable and meaningful. The purpose of this chapter will be to interpret, label and discuss the interrelationships of the dimensions of academic self-concept for each sex. The item contents and dimension intercorrelations reported in Chapter IV will form the basis for this presentation.

Discussion of Male Dimensions

Dimension I for males (see Table 4.3, supra p. 49) gains particular significance in the present study, due to the fact that multiple scalogram analysis indicates the ranking of items as well as individuals on a particular dimension. This dimension is a global or general factor and includes all those aspects of an individuals self-concept which conceivably could be related to achievement. The significance of Dimension I lies in the comparative item rankings. The first ten items appear to be concerned with a general personality factor which is characterized by how the individual controls his behaavior. The next five items tend to characterize behavior which is "people oriented", i.e. behavior that is motivated by a desire to respond to an action or reaction of another individual. In the academic setting the individual producing the response would be the teacher. The last ten items could be evaluated as intellectual characteristics which are associated with academic success.

It is interesting to note that this last set of items, the "intellectual group", are ranked at the bottom rather than at the top of the dimension as one might expect. The reverse in ranking indicates that students feel the evaluations of their school performance is not primarily a function of their aptitude. Because the concepts describe an individual who is interested in learning the class subject matter, because he knows this is required to obtain a grade, and because the defined behavior indicates the operation of extrinisic motivation, Dimension I is labeled, Achievement via Traditional Academic Role Taking.

The items on male Dimension II (see Table 4.4, supra p. 50), characterize an individual who is a conformist, and is concerned with the practical ramifications of his behavior. This behavioral concern is related, not only to relationships with teachers, but is also generalizable to peer contacts. He is not concerned with seeking knowledge, but achieves because of his conformity to the usual and acceptable mode of academic classroom behavior. Dimension II is labeled, Achievement via Academic Conformity.

Dimension III (see Table 4.5, supra, p. 51) characterizes the individual who is careful, intellectual, efficient, studious, and competent. He is interested in obtaining a complete understanding of subject matter. He wants to master the basic concepts which underlie the reasons for classroom presentations. Furthermore, he is interested in application of subject matter. The item content implies motivation to learn for learnings sake. Dimension III is labeled, Achievement via Intrinsic Motivation.

Dimension IV for males is seen as a ranking of items which

describe the goal oriented or goal directed individual. The goals may or may not be those of the teacher. A student who would choose these items is concerned with demonstrating his "brightness". He may undertake self intitiated projects which might be presented to the class. He might be called an "intellectual show-off". Logically following from a discussion of the items on Dimension IV, the label of Achievement via Unique Accomplishment is given to this dimension (See Table 4.6, supra, p. 52)

Considered in totality, the four male dimensions suggest several interrelationships. Because Dimensions I and II are both concerned with the teacher's evaluation of the student's motivation a high intercorrelation between these two dimensions would be expected. Because of the interpretation emphasizing social conformity, rather than an intellectual or academic ranking of items, it is expected that Dimension II will correlate highest with all other male dimensions. Both of the above predicted correlational trends are supported by the results reported in Table 4.12 (supra, p. 57). The correlation of Dimension I with Dimension II was .84. This fact might justify the visualizing of these two dimensions as combined on a "motivational continum", being characterized at one extreme by extrinsic and at the other by intrinsic motivation.

The intercorrelations of Dimension II with the other three dimensions justifies it's being considered as a relatively independent dimension of academic self-concept. The correlations were found to be .43 with Dimension III and .31 with Dimension IV.

Discussion of Female Dimensions

Dimension I for females tends to characterize an individual, (see Table 4.7 supra, p. 53) who does what she is told, immediately, and in an orderly, efficient and intelligent manner. This type of female student is responsive to the conforming demands of the teachers. She has experienced positive reinforcement from her teachers for this type of behavior. Her self-concept has incorporated an expectancy of pleasing the teacher. Females characterized by Dimension I would represent the total range of academic ability. Dimension I is labeled, Achievement via Traditional Academic Role-Taking.

The second female dimension describes an individual who is concerned with what people think of her. She desires to be accepted by her peers. She is also academically competitive. These two seemingly contradictory trends are resolved by being competitive but using socially acceptable, or peer acceptable behavior. In Dimension I the emphasis was on conformity to teacher's demands, in Dimension II, however, the emphasis is on conformity to the expectations of the peer group. If peer conformity is characteristic of the achievement of females as a group, it would be expected that homogenity would be found in their academic performance. Research has frequently indicated that such an observation is justified. Dimension II for females will be labeled, Achievement via Peer Normative Competition (See Table 4.8, supra p. 54).

Female Dimension III (see Table 4.9, supra, p. 55), describes a non-conformist. She is independent and considers herself as not being average. She is content with her independence. In the academic setting,

she pursues academic interests which may or may not be similar to those of the teacher or her classmates. There is, however, apparently sufficient overlap with teacher's goals to allow for an acceptable level of achievement. Such an individual is probably above average in intelligence. Dimension III is labeled, Achievement via Academic Independence.

Dimension IV for females, as presented in Table 4.10 (supra, p. 55), characterizes an individual who meets the teachers' sterotyped conception of the "good" student, i.e. logical, consistent, and studious. A student so characterized would be primarily concerned with meeting the teacher's specified requirements, and in general with functioning within a structured classroom program. It might be hypothesized that such an individual would be of average intelligence. Dimension IV is labeled, Achievement via Meeting Teacher Expectations.

The fifth female dimension (see Table 4.11, supra, p. 56), describes the student who is content to think, contemplate and investigate academic problems. Although the concept of "creative" did not scale on this dimension, it is felt that the content of item 83 (A Thinker), together with item 119 (Serious), tends to carry this connotation. Creativeness in female behavior is traditionally and frequently valued more highly by teachers, than is similar behavior in males. The item content of this dimension also implies an "intellectual" type of individual. An intellectual, however, who is able to maintain academic endeavors within the teacher and peer group social context. In this respect, this dimension closely approximates the traditional conception of the "gifted" student. Following from the above discussion, Dimension V for females is labeled, Achievement via Intellectualizing.

With the exception of Dimension III, the female dimensions appear to have more common than unique elements. It would be expected, therefore, that the correlations of Dimension III with the other four dimensions would be relatively small. This prediction finds statistical support in Table 4.13 (supra, p. 58), because the intercorrelations between Dimension III and the remaining dimension range from +.13 to -.02, a low and restricted range.

Discussion of Sex Differences

Sex differences in academic self-concept are apparent not only in the dimensions obtained by multiple scalogram analysis, but also from a comparison of the items in the Word Rating List selected by males and females (See Appendix B). An evaluation of the discriminating items selected by each sex yields the following trends:

1) Females present strong indications that they do not see themselves as procrastinators. Two items, number 20 (procrastinator) and number 50 (a person who postpones), describing this characteristic were significantly avoided by them (discriminated in negative direction). Males avoided only item 50.

2) Females do consider themselves as being distractable. Items 35 (distractable) and 117 (easily distracted) were significant discriminators between female under- and overachievers. Only item 35 was a significant discriminator for males.

These two above findings indicate sex differences are of degree rather than kind. The following indicate fairly marked sex differences:

3) Males evidence consideration of themselves as "ambitious".

Item 85 (ambitious) did not scale for females.

4) Males did not evaluate themselves as being "carefree", females did evaluate themselves in this way.

5) Males, not females consider themselves as being "different".

6) Item 5, "practical", discriminated between males and females, in favor of the males.

In addition to the above noted item differences, several interpretable differences in the dimensions obtained from scalogram analysis for males and females should be considered.

Both the male and female Dimension I contained item content which implied taking the traditional academic role in order to obtain scholastic success. In the male dimension, emphasis was on extrinsic motivation, whereas, the female dimension emphasized intelligent conformity. Dimension II for males is similar in content to the female Dimension I.

Dimension III for females is similar to male Dimension IV, in that both describe individuals who are academically independent. The emphasis in the female dimension, however, is on intellectual independence, and not on unique academic independence.

The significance of why a peer related dimension did not appear for males is difficult to evaluate. It may be that peer related academic behavior is not characteristic of males, or this type of behavior was not significantly discriminating between male under- and overachievers. Another explanation might be found by investigating the grouping of the items on scale, i.e. the absence of this type of dimension might be an artifact of the analysis procedure. A more plausible evaluation

might be that due to the nature of the male role, as it is perpetuated in our society, with emphasis on individualistic or competitive types of behavior, the frequency of male group behavior in the school setting is significantly decreased.

In summarizing the discussion of this section, the following trends might be highlighted:

1) Males tend to view themselves as being ambitious, concerned, conforming, and practical.

2) Females tend to see themselves as not being ambitious, but carefree, different and impractical.

3) The keynote of differences between male and female academic self-concepts is the selection of an identifying "significant other". Females tend to choose the teacher or peers, males tend to select teachers, or some other individual or group not identifiable in the present study.

Academic self-concept is not a singularly generalizable or unidimensional trait.

The male and female dimensions of academic self-concept, as interpreted and labeled in the previous three sections of this chapter, gain significance because of their similarities and differences, when related to the academic self-concept theory presented in Chapter I (supra, p. 4-7).

Interpretation of Dimensions in Relation to Theory

The four basic tenets of Brookover's social psychological concep-

ception of academic self-concept,[1] which were used as the theoretical base of the present study, may be summarized as follows:

1) the student learns what he perceives he is able to learn, and

2) his perception of his ability to learn is a function of the expectations significant others have for him.

The present investigation has demonstrated possible refinements of Brookover's academic self-concept theory.

Several types and sub-types of academic self-concepts were derived from the empirically constructed item dimensions. This finding is interpreted as demonstrating the statistical validity for the theoretical assumption that persons behave in ways that each perceive appropriate to himself. Appropriateness of behavior is determined by each person through internialization of the expectations of significant other. It had been assumed that teachers were the primary significant others in the academic setting. Interpretation of the dimension analyses data indicates, however, the presence of at least two other categories of significant others. One of these categories was identified as peer groups. The other category, which was associated with the "individualistic-independent" or "ego" self-concept type, was not identifiable by name. Logically following from this finding, is the hypothesis that variations in value orientations or behavioral expectancies on the part of a significant other for a given individual.

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[1] Wilbur B. Brookover, "A Social Psychological Conception of Classroom Learning", School and Society, 1959, Vol. 87, pp. 84-87.

Tenet III (see Chapter I, supra, p. 6), of the basic academic self-concept theory is that; "The functional limits of one's ability to learn are determined by his self-conception or self-image as acquired in social interaction". Evidence for the empirical and theoretical validity of this tenet was found in the present data. The influence of social interaction was seen in the dimensions of both males and females. This trend was particularly evident in females, usually being indicated by conforming type behavior.

A schematic diagram dipicting possible refinements of the basic academic self-concept theory of the present study is found in Figure 5.1.

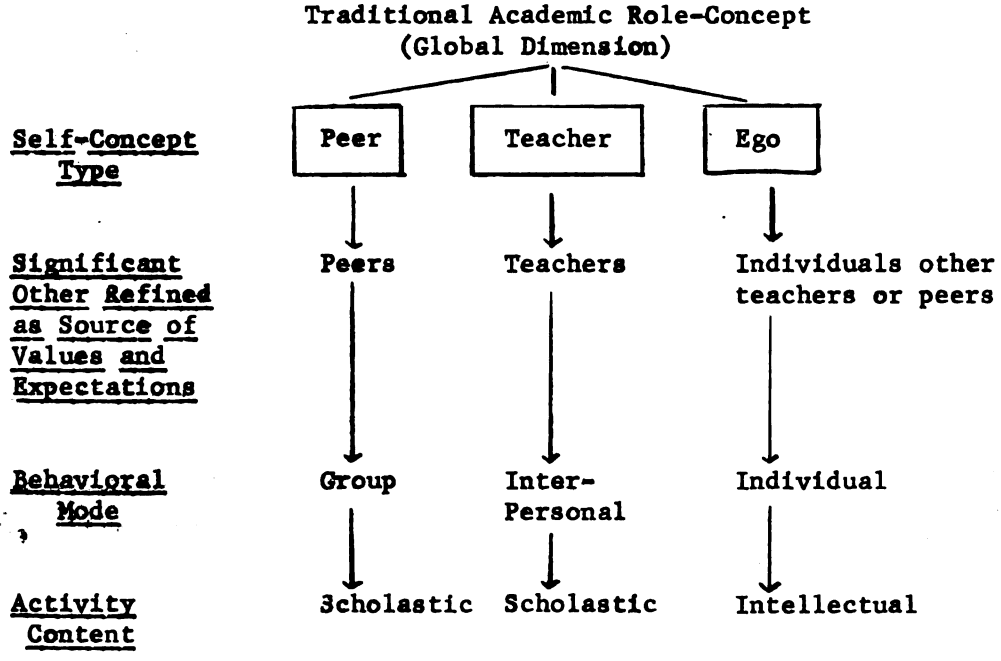

Figure 5.1 Schematic Representation of Academic Self-Concept Types in Relation to Hypothetical Generic Variables

The three self-concept types are all seen as emerging from the Traditional Academic Role Concept. This global or general dimension was

found to be present in both males and females. The self-concept-type lables are arbitrary, but were chosen with a view toward theoretical integration of self-concept-types and hypothesized generic variables indicated in Figure 5.1.

A note of caution is offered in summary. At no time in the present investigation was an attempt made to deliniate cause and effect relationships. Furthermore, relationships discussed in the immediately preceding section are of a hypothetical nature.

Summary

In chapter V the item content of the four male and five female dimensions of academic self-concept were hypothetically integrated. This integration took the form of, 1) determining the psychological meaning of each dimension, and labeling each group of items accordingly, 2) discussing the implications of sex differences in academic self-concept dimensions, and 3) evaluating the dimensions in relation to academic self-concept theory.

The dimensions of academic self-concept determined in the present study were labeled as follows, for <u>males</u>;

D_1 Achievement via Traditional Academic Role-Taking
D_2 Achievement via Academic Conformity
D_3 Achievement via Intrinsic Motivation
D_4 Achievement via Unique Accomplishment

The five <u>female</u> dimension labels were;

D_1 Achievement via Traditional Academic Role-Taking
D_2 Achievement via Peer Normative Competition
D_3 Achievement via Academic Independence
D_4 Achievement via Meeting Teacher Expectations
D_5 Achievement via Intellectualizing

After considering the basic academic self-concept theory in light of the empirical results of the present study, it was decided to retain the four basic tenets, but make the following refinements; 1) consider the academic self-concept as consisting of one global or general dimension and three sub-types (peer, teacher, and ego), 2) consider individuals other than teachers as being perceived as a significant others, 3) depending on which significant other, variations in value orientation, behavior mode, and expectations should be anticipated.

CHAPTER VI

SUMMARY, CONCLUSIONS AND RESEARCH IMPLICATIONS

Summary

The major problem of the present investigation was to determine the dimensions of academic self-concepts of eleventh grade male and female eleventh grade students.

Theoretical assumptions were drawn from the psychological perceptual theorists and the symbolic interaction frame work of social psychology. Self-concept was viewed as a functionally limiting factor in school achievement. Three therotical assumptions were made: 1) the student learns what he perceives he is able to learn, and 2) the teacher, as a significant other, has an important influence on the development of a child's self-concept, which in turn affects his ability to perform in the academic setting, and 3) under- and overachievers will differ significantly on a measure of academic self-concept.

A one-hundred and nineteen item rating scale was developed which purported to measure academic self-concept. The student was asked to rate word or phrase as he thought his teachers would, in describing him as a student. A four point rating scale was used. The instrument constructed was one of several experimental instruments created for inclusions in a motivational test battery being used in an on-going research

project conducted at Michigan State University.[1]

The measure of academic self-concept, labeled the Word Rating List, was administered to samples of statistically defined under- and overachieving eleventh grade students of each sex.

Using Chi square model to determine item discrimination, it was found that 40% or 48 of the original 119 items held up after cross-validation for each sex, at the .10 level of significance. It was further found that of the 48 discriminating items, 35 or 73% were in common to both sexes. Hoyt's analysis of variance technique was used to determine the reliability (internal consistency type) of the total scale scores.[2] The resulting reliabilities ranged from .91 to .93 for males and from .88 to .93 for females in various samples.

Using the cross-validated items for each sex, a multiple scalogram dimension analysis was performed. This analytic procedure is a nonparametric, datareduction technique for maximizing interitem reliabilities, such that both subjects and items are uniquely ordered, i.e. form a unidimensional or Guttman type scale. Multiple scalogram analyses set at an acceptable error level of .80 yielded four male and five female dimensions which accounted for 96% and 98% of the male and female cross-validated items respectively. An index of reliability (stability) of the resulting dimensions was obtained. This index, reproducibility (R),

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[1]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying Achievement of Eleventh Grade High School Students, Research Project No. 846 (8458); Supported by the U.S. Office of Education, in cooperation with Michigan State University, 1959.

[2]Cyrl J. Hoyt, "Test Reliability Estimated by Analysis of Variance", Psychometrika, 1941, Vol. 6, pp. 153-160.

is a measure of the degree of accuracy with which the item response patterns can be duplicated from knowledge of the total score alone. The four male dimensions had average reproducibilities of .77 and the five female dimensions had average reproducibilities of .63. A summary of the four male and five female self-concept dimensions, together with their respective interpretive emphasis is found in Tables 6.1 and 6.2.

Conclusions

On the basis of the results of the present study, several conclusions are made.

Following from the item analysis results of the Word Rating List it is concluded that:

1) A reliable measure of academic self-concept can be constructed.

2) Under- and overachieving students differ significantly in their academic self-concepts.

3) The functioning of an objective instrument which measures academic self-concept can be accounted for by theory

4) The items which significantly discriminated between male under- and overachievers are not essentially different than those which discriminated between female under- and overachievers

From the results of dimension analyses of the cross-validated items for males and females, the following conclusions are warranted:

1) Academic self-concept is not a unidimensional trait.

2) A major dimension is found in the academic self-concepts of both males and females which holds common evaluative and interpretative significance.

3) Despite the fact that the interdimensional correlations within each sex are generally high, several relatively independent sex linked dimensions are present and interpretable.

When the results of the dimension analyses are related to basic

TABLE 6.1

Summary Dimensions in the Academic Self-Concepts of Male Under- and Overachievers (N=298)

	Dimension Level	Interpretive Emphasis
D_1	Achievement via Traditional Academic Role Taking	Description of individual interested in learning subject matter as it is required for grade getting
D_2	Achievement via Academic Conformity	Mode of achievement is by conformity to socially acceptable types of classroom behavior
D_3	Achievement via Intrinsic Motivation	Desire to know background, underlying concepts, and applications of subject matter. Mastery of material is motivation.
D_4	Achievement via Unique Accomplishment	Personal or self goals take presidence. Demonstrations of individually initiated projects.

TABLE 6.2

Summary Dimensions in the Academic Self-Concepts of Female Under- and Overachievers (N=312)

Dimension Level	Interpretive Emphasis
D_1 Achievement via Traditional Academic Role Taking	Carries out task immediately upon assignment. Is orderly, efficient and intelligent.
D_2 Achievement via Peer Normative Competition	Social awareness. Peer group is source of value frame of reference and expectations
D_3 Achievement via Academic Independence	Non-conformist, independent and not average. Pursues own academic interests
D_4 Achievement via Meeting Teacher Expectations	Identification with teacher as significant other. Emphasis on meeting teachers specified requirements
D_5 Achievement via Intellectualizing	Describes an individual who is content to think, contemplate and in general mentally investigate without consideration of practicality in view of classroom expectancies.

academic self-concept theory, the following conclusions are drawn:

1) The academic self-concept of a student is characterized by the taking of a tradition academic role.

2) The academic role takes on three different orientations, peer, teacher, or ego, depending upon the degree to which he has identified with a significant other.

3) The teacher is not the only significant other in a students life. Peers, parents, and other influential individuals may be perceived as being significant.

4) The mode of academic behavior, type of activity, values and expectations for any one of the three academic self-concept subtypes or orientations (peer, teacher, ego), varies with the significant other.

Research Implications

A number of recommendations for future research studies are tenable.

Several studies using the available data are feasable.

1) Test the agreement of different analytic procedures (e.g. factor analysis or agreement (pattern) analysis) in identification of dimension of academic self-concept.

2) Using a normal achieving population (not including under- and overachievers) or a random sample of the general population, compare the obtained dimensions of academic self-concept.

3) Measures of motivation for academic achievement are available from the Farquhar Motivational Research Project. In as much as evaluations of self-concept have been demonstrated to be concerned with motivational variables a correlational study of academic self-concept and academic motivation would be a significant investigation.

4) Correlate academic self-concept measures with socio-economic class indicies.

Other investigations are suggested from the present study which would necessitate obtaining new data.

1) A predictive study, using academic achievement, measured by grades or achievement test results as the dependent variable, and the present measure of academic self-concept as the indepent variable is needed.

2) As self-concept is developed early in life, and in as much as parents could be perceived as academic significant others, a correlational study of academic self-concept and measures of child training practices is suggested.

3) A significant research question would be, "Does academic self-concept vary as a function of intelligence or academic aptitude?"

4) If relatively "pure" measures of the peer, teacher, and ego academic self-concept sub-types could be obtained, and a sample of individuals could be identified who represent these types, a study of the ratings of peers, teachers and self of the individuals within the three sub-type groups would give some indication of the contruct validity of the present academic self-concept theory.

5) Using a questionnaire of semi-structured interview approach, it would be of theoretical interest to determine the possible range of significant other types, and why they are so characterized.

6) Finally, using group or individual counseling procedures, or specially trained teachers, or both, an experimental study attempting to bring about positive change in individuals who have low academic self-concepts is needed.

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APPENDIX A

TABLES OF SUMMARY CHARACTERISTICS OF STUDENTS REPRESENTING ACADEMIC EXTREMES

TABLE A.1

SUMMARY STUDENT CHARACTERISTICS OF ACADEMIC EXTREMES[1]

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
College Subjects		College Subjects	
Males and Females		Males and Females	
1. Spent less time at movies and reading optional assignments	Gerberich[2]	1. Manic (hypomania)	Altus[2]
2. Spent more time in sleep, meals and classroom	Gerberich	2. Unwillingness to conform to academic requirements	Brown, Ables
3. Felt teachers fair	Gerberich	3. Activity delay (lack of decisiveness to action, tendency to procrastinate)	Brown, Ables
4. Liked teachers	Gerberich	4. Does not value school	Holland '59
5. Liked classes	Gerberich	5. Impulsive	Holland '59
6. Prompt with school work	Gerberich	6. Less intense super-ego qualities	Holland '59

[1]This table compiled by W. W. Farquhar; D. A. Payne; W. H. Chubb; and M. D. Thorpe

[2]Refer to bibliography for complete citation of research source.

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
7. Frequent leader	Wedemeyer	7. Positive self concepts	Holland '59
8. Studied more, better study techniques and habits	Dowd, Neel	8. Are socially adept	Holland '59
9. Higher reading comprehension	Dowd	9. Greater difficulty in using study techniques	Gerberich
10. Greater grasp of mechanics of English	Dowd	10. Greater difficulty in paying attention in class	Gerberich
11. Introversiveness reaching pathological proportions	Horrall '57	11. Felt they had not gotten the material things in life they wanted from their parents	Shaw & Brown
12. Marked lack of emotional responsiveness	Horrall '57	12. Hypercritical	Shaw & Brown
13. Less controlled emotional responsiveness	Horrall '57	13. Avoid leadership role	Wedemeyer
14. Give evidence of inner tension (Ror m)	Horrall '57	14. Unwise distribution of time	Dowd
15. Feel they are more adequate people (TAT)	Horrall '57	15. Disliked courses and professors	Dowd
16. Experience less conflict about school performance (TAT)	Horrall '57	16. Feel they do not have efficient study habits	Neel
17. Experience less conflict about health (TAT)	Horrall '57	17. Have masculine interests	Holland '59

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
18. Experience less conflict about personal achievement (TAT)	Horrall '57	18. Poorer form perception (Ror F-)	Horrall '57
19. Experience less conflict about mother's behavior (TAT)	Horrall '57	19. More extensive feelings of discouragement and apprehension (TAT)	Horrall '57
20. More adequate adjustment (TAT)	Horrall '57	20. Feel more inferior to their fathers (TAT)	Horrall '57
College Subjects		**College Subjects**	
Male		**Male**	
21. Higher need for achievement	Gebhart	21. Higher need for Affiliation	Gebhart
22. Higher need for intraception	Gebhart	22. Higher need for change	Gebhart
23. Higher need for order	Gebhart	23. Science worst subject	McQuary '54
24. Higher need for Consistency	Gebhart	24. Have interests of persons in business detail occupations	Morgan
25. Parents have less formal education	McQuary '54	25. Tendency to depression	Owens
26. Realistic	Morgan	26. Too socially oriented and active	Owens
27. Insightful	Morgan	27. Not enough time spent studying	Owens

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
28. High integrity	Morgan	28. Spent more hours in extra curricular work	Divesta
29. Dependable	Morgan	29. Less often reviewed their notes the same day they were taken	Divesta
30. Responsible	Morgan	30. Felt they could not organize their notes well	Divesta
31. Have interests typical of social service	Morgan	31. Felt their courses less necessary for their purposes	Divesta
32. High interest maturity	Morgan	32. Had less often been away from home	Divesta
33. Are more dominant	Morgan		
34. Persuasive	Morgan		
College Subjects		College Subjects	
Females		Females	
35. Obtains ego satisfaction through academic work	Mitchell	33. Father perceived on less successful figure	Malloy
36. Not competitive	Mitchell	34. Does not select challenging goals	Malloy
37. Conservative goal setting	Mitchell	35. Disciplined more frequently	Malloy
38. Feelings of unworthiness	Mitchell	36. Conformist	Malloy

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
39. Associates with other over-achievers	Malloy	37. Feel socially inadequate	Malloy
40. Family fosters independence	Malloy	38. Date less	Malloy
41. Disciplined less frequently	Malloy	39. Mother shields daughter from criticism of father	Malloy
42. High level of aspiration	Malloy	40. Does not value grades	Malloy
43. Likes school	Malloy	41. Poor self concept	Malloy
44. Good self-concept	Malloy	42. Works only on subjects interested in	Malloy
45. Is non-conformist	Malloy	43. Family uses special rewards for performance	Malloy
46. Father perceived as successful figure	Malloy	44. Associates with other under-achievers	Malloy
47. Family does not give special reward for academic success	Malloy	45. Can fulfill ego needs in non-academic areas	Mitchell
48. Persistent	Malloy	46. Unrealistic goal setting	Mitchell
		47. Defensive	Mitchell
		48. High manifest anxiety	Mitchell

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
High School Subjects		High School through College Subjects	
Male and Female		Male and Female	
49. Usually oldest or youngest sibling	Musselman	49. Vague occupational and academic choices	Gowan '57
50. Smaller families		50. Weak ego controls	Gowan '57
51. Higher socio-economic status	Musselman	51. Socially withdrawn	Gowan '57
52. Father was significant figure	Pierce	52. Poor use of time and money	Gowan '57
53. Had mothers who held higher educational aspirations	Pierce	53. Lack of competency in reading and arithmetic	Gowan '57
54. Tend to come from small families and be first born or only child	Pierce	54. More frequently display psychotic or neutrotic tendencies	Gowan '57
55. Had parents who were better educated	Pierce	55. Have authoritarian parents	Gowan '57
56. Mothers dominating and ignoring	Drews	56. Immature	Gowan '57
57. Parents more punitive	Drews	57. Lack of goals or unrealistic goals	Gowan '57
58. Home role rigidly defined with expectencies of docile acceptance	Drews	58. Lack of responsibility	Gowan '57

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
High School Subjects (cont.)		High School through College Subjects (cont.)	
Male and Female		Male and Female	
59. Denial of ill-will and animosity	Gough '53 (b)	59. No serious interests	Gowan '57
60. Absence of interpersonal friction	Gough '53 (b)	60. Disinterest in others	Gowan '57
61. Accepting of others	Gough '55	61. Submissive	Gowan '57
		High School Subjects	
		Males and Females	
62. Higher on leadership skills	Pierce	62. Unable to create warm relationships	Fliegler
63. Better peer identification	Pierce	63. Tended to be more unsocial	Fliegler
64. Adult standards unquestioned	Drews	64. Dislikes people - parental figures, authority figures, siblings, and peers	Fliegler
65. Conforming	Drews Gough '53 (b)	65. Familial pattern of indifference and rejection	Fliegler
66. Has good study habits	Gough '53 (b)	66. Father more often absent from home	Passow
67. Has sense of academic effectiveness	Gough '53 (b)	67. Do not expect good grades	Passow

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
High School Subjects (cont.)		High School Subjects (cont.)	
Male and Female		Male and Female	
68. Value high grades	Pierce	68. More maladjustment	Pierce
69. Adjust to reality demands of classroom	Drews	69. Higher "Manic" score on MMPI	Gough '49
70. Capacity for sustained and diligent application	Gough '53 (b)	70. Higher "Psychopathic deviate" score on MMPI	Gough '49
71. Like planfulness	Gough '53 (b)	71. Higher "Psychothenia" score on MMPI	Gough '49
72. Basic seriousness of purpose	Gough '53 (b)		
73. Has sense of accomplishment	Gough '53 (b)		
74. Docile	Drews		
75. Orderly	Drews		
76. Emphasizes equanimity and rationality	Gough '53 (b)		
77. Integrative mind and personality	Gough '53 (b)		
78. Great vitality	Gough '53 (b)		
79. Personally efficient	Gough '53 (b)		

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
High School Subjects (cont.)			
Male and Female			
80. Rejection of the frivalous and diversionary	Gough '53 (b)		
81. Self-control	Gough '53 (b)		
82. Optimistic, self-confident	Gough '53 (b)		
83. Compensating for handicaps	Musselman		
84. Better adjusted psychological	Pierce		
85. Higher monetary goals	Pierce		
86. Occupational interest maturity higher (on SVIB)	Gough '53 (b), Kurtz		
87. More active in religious areas	Pierce		
High School Subjects		High School Subjects	
Males		Males	
88. Have Mothers who are more democratic	Pierce	72. Negative relationship with fathers	Kimball '52
89. Higher needs for achievement	Pierce	73. Less able to give direct effective expression to their negative feelings	Kimball '52

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
		High School Subjects	
		Males	
		74. Guilt and anxiety about aggressive feelings	Kimball '52
		75. Attitudes of hostility	Shaw and Grubb
		76. More aggressive	Pierce
High School Subjects		High School Subjects	
Females		Females	
90. Better adjusted emotionally	Musselman	77. Had mothers who were more authoritarian	Pierce
91. High need for individual recognition	Pierce		
Elementary through High School Subjects		Elementary through High School Subjects	
Males and Females		Males and Females	
92. Want to please parents and respect them	Kurtz	78. Limited and vague educational and vocational plans	Kurtz
93. Have parents who show interest, pride, affection	Kurtz	79. More desire to work with hands than book learning	Kurtz
94. Good opinion of self	Kurtz	80. More frequently have sex problems	Kurtz

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
Elementary through High School Subjects		Elementary through High School Subjects	
Males and Females		Males and Females	
95. Derive satisfaction from book learning	Kurtz	81. More lack of self-confidence	Kurtz
96. Original	Kurtz	82. More unhappy	Kurtz
97. Exhibit leadership qualities	Kurtz	83. More restless	Kurtz
98. Parents demand good adjustment among family members	Kurtz	84. More changeable	Kurtz
Elementary Subjects		Elementary Subjects	
Males and Females		Males and Females	
99. Smaller families	Lewis	85. Often find cultural deficiency	Lewis
100. Come from superior homes, (Profs., semi-profs.)	Lewis	86. More adventuresome	Lewis
101. Intellectual hobbies (reading, collecting)	Lewis	87. Less self-reliant	Lewis
102. Interested in music	Lewis	88. Less investigative	Lewis
103. Generous	Lewis	89. Less original	Lewis
104. Physically energetic	Lewis	90. Less dependable	Lewis

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR
Elementary Subjects			
Males			
105. Feeling of belongingness in relation to parents	Walsh		
106. Freedom of and adequacy of emotional expression	Walsh		
107. Feel free to initiate achievement	Walsh		

TABLE A.2

SUMMARY PERSONALITY CHARACTERISTICS ASSOCIATED WITH ACADEMIC EXTREMES[1]

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
College Subjects		**College Subjects**	
Males and Females		**Males and Females**	
1. Obtains ego satisfaction through academic work	Mitchell[2]	1. Fulfill ego needs in other than academic area	Mitchell[2]
2. Motivational system not characterized by a strong sense of competitiveness	Mitchell	2. Lacks motivation	Mitchell, Holland '59
3. Have feelings of unworthiness	Mitchell Holland '59	3. Chronic non-achievement	Mitchell
4. Conservative goal setting	Mitchell	4. Free floating and high anxiety	Mitchell Horrall '57
5. Over-compensates	Mitchell	5. Defensive behavior	Mitchell
6. Study more than non-achievers (have good study technique)	Dowd Gerberich	6. Unwise distribution of time and need inspiration to study	Dowd Lum

[1]Compiled by R. G. Taylor

[2]Refer to bibliography for complete citation of research source.

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
7. Get assignments in promptly	Gerberich	7. Tend to dislike courses and professors	Dowd Lum
8. Like most of their classes and instructors, feel they get a "square deal" in class	Gerberich	8. Goals inconsistent with measured interests	Dowd
9. Choose subjects because of interest and/or aptitude	Hopkins-Molleson, and Sornoff	9. Greater difficulty in paying attention in class	Gerberich
10. Achievement motivated by drive for power	Middleton & Gutherie	10. Greater difficulty in using study techniques	Gerberich
11. Achievement motivated by resentment	Middleton & Gutherie	11. Recognize a greater degree of difference in difficulty between high school and university work than is true of the high scholarship group.	Gerberich
12. Achievement motivated by dependence	Middleton & Gutherie Merrill & Murphy	12. Came to college for social reasons and strong affiliation need	Gerberich, Hopkins-Molleson, and Sornoff Gebhart & Hoyt
13. Achievement motivated by social acceptance	Middleton & Gutherie	13. Chose subjects because of parental pressure or as a means to a profession	Hopkins-Molleson, and Sornoff
14. Achievement motivated by aggression	Middleton & Gutherie	14. Decide on their careers at a much earlier age than others (this decision would be more heavily influenced by parent's aspirations)	Hopkins-Molleson and Sornoff Mitchell

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
15. Interest typical of persons in social service or welfare	Morgan	15. Less confident of occupation choice than other students	Hopkins-Molleson and Sornoff
16. Interest maturity higher (males only)	Morgan	16. Trend toward pleasure seeking	Middleton & Gutherie
17. Dominant	Morgan Merrill & Murphy	17. Trend toward extroversion	Middleton & Gutherie
18. Drive to organize and plan life (males only)	Gebhart & Hoyt, Diener, Krug	18. Trend toward denial of normal shortcomings	Middleton & Gutherie
19. Consistent (males only)	Gebhart & Hoyt	19. Trend toward power seeking and acceptance	Middleton & Gutherie
20. Optimistic (males only)	Morgan	20. Interests of persons in business detail occupations (males only)	Morgan
21. Persuasive (males only)	Morgan	21. Interests of persons in business sales occupations (males only)	Morgan
22. Dependable and responsible (males only)	Morgan	22. Overly critical of others	Shaw and Brown
23. Seriousness of purpose (males only)	Morgan	23. Feelings of hostility to authority	Shaw and Brown

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
24. Energetic (males only)	Morgan	24. Unstable and maladjusted	R. Stagner Horrall '57
25. Self-confident	Morgan Lum	25. High emotionality	Stagner
26. Insightful and realistic attitudes (males only)	Morgan	26. High self-sufficiency	Stagner
27. Awareness of and concern for other person (males only)	Morgan Gebhart & Hoyt	27. Lacks decisiveness to act	Brown, Abeles and Iscoe
28. Motivation to achieve or need for achievement	Morgan Lum Gebhart & Hoyt Krug	28. Tends to procrastinate	Brown, Abeles and Iscoe Lum
29. Lack of capacity foe status	Holland '59	29. Unwilling to conform to academic requirements	Brown, Abeles and Iscoe
30. Are unsociable	Holland '59 Horrall '57 Merrill & Murphy Krug	30. Psychoneurosis with compulsive and depressive features	Barbara Kirk
31. Minimize worry and complaints	Holland '59	31. Tend to be resistant to externally imposed tasks	Barbara Kirk
32. Conscientious	Holland '59	32. Self-derogation and depression	Barbara Kirk

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
33. Well-controlled	Holland '59 Horrall '57 Lum	33. Hysterical personality	Barbara Kirk
34. Create a favorable impression	Holland '59	34. Conflict over conduct	Horrall '57
35. Does well academically under direction but is not as adept in situations demanding independent judgment	Holland '59	35. Conflict over sex	Horrall '57
36. Interested in and responsive to feelings of others	Holland '59	36. Have feelings of inadequacy	Horrall '57
37. Have feminine interests	Holland '59 Krug	37. Greater concern about health	Horrall '57
38. Feel comfortable about their conduct in general	Horrall '57	38. Immature reaching out for contact experience	Horrall '57
39. Feel comfortable in the area of sex	Horrall '57	39. Are poised and socially skillful	Holland '59
40. Feel adequate as a person	Horrall '57	40. Have positive self-attitudes	Holland '59
41. Display more inner tension	Horrall '57	41. Are flexible	Holland '59
42. More deferent	Merrill & Murphy	42. Admit worries and complaints	Holland '59

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
43. Less exhibitioustic	Merrill & Murphy	43. Have less intense super-ego qualities	Holland '59
44. Less concerned about change	Merrill & Murphy	44. Is impulsive	Holland '59
45. More enduring	Merrill & Murphy Krug	45. Creates a less favorable impression	Holland '59
46. Less controlled emotional responsiveness-marked lack of emotional responsiveness	Horrall '57	46. More extraceptive and masculine interests	Holland '59
47. Good over-all adjustment	Horrall '57	47. Social service drive	Gebhart & Hoyt
48. Less conflict about own school performance	Horrall '57	48. Need for change	Gebhart & Hoyt
49. Less deep underlying anxiety	Horrall '57	49. Artistic interests and temperament	Diener
50. More mature affect	Horrall '57		
High School Subjects		High School Subjects	
Male and Female		Male and Female	
51. Optimistic self-confidence	Gough '53, Kurtz & Swenson Gowan '57	50. Chose future occupation because of influence of others	Armstrong

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
52. Self-control	Gough '53 Gowan '57	51. Had future vocational goals which did not agree with their dominant interests as measured by Kuder Voc.	Armstrong
53. Capacity for sustained and diligent application	Gough '53	52. Obtained greater number of low scores on the Computational Scale of Kuder Vocational	Armstrong
54. Acceptance of convention	Gough '53	53. Obtained more low scores in the area of "Preference for avoiding conflict" on Kuder Personal	Armstrong
55. Rejection of the frivolous and diversionary	Gough '53	54. Obtained lower ratings on cooperation, dependability and judgment	Armstrong
56. Orderliness	Gough '53	55. Preferred companions older than themselves (males only)	Armstrong
57. Planfulness	Gough '53	56. Were not chosen to positions of responsibility in extra-curricular activities (females only)	Armstrong
58. Basic seriousness of purpose	Gough '53 Gowan '57	57. Much underlying aggression, seldom expressed or indirectly expressed (males only)	Kimball '53

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
59. Personal and intellectual efficiency	Gough '53 Pierce	58. Strong feelings of inferiority, passivity, prominent dependency needs (males only)	Kimball '53
60. Vitality	Gough '53	59. Almost deliberate failure, (with inferiority feelings) (males only)	Kimball '53
61. Acceptance of others	Gough '53 Gowan '57 Pierce	60. Defensive about abilities and anxious to maintain a belief in their own superiority (males only)	Kimball '53
62. Denial of ill-will and animosity	Gough '53	61. Negative attitude toward education in general (males only)	Kimball '53
63. Achievement oreinted via conformance	Pierce	62. Show greater tendency toward feminine identification than normal achievers (males only)	Kimball '53
64. Achievement via independence	Pierce	63. Aggression, more overt in early childhood, little direct outlet for hostile feelings (males only)	Kimball '53
65. More flexible	Pierce	64. Choose friends with low achievement or unfavorable attitude toward school	Kurtz & Swenson
66. Absence of interpersonal friction	Gough '53	65. Restless	Kurtz & Swenson

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
67. Emphasis on equanimity and rationality	Gough '53	66. Changeable	Kurtz & Swenson
68. Sense of academic effectiveness	Gough '53	67. Unhappy	Kurtz & Swenson
69. Good study habits	Gough '53	68. Lack confidence in themselves	Kurtz & Swenson Gowan '57
70. Sense of accomplishment	Gough '53	69. Have problems of heterosexual adjustment	Kurtz & Swenson
71. Peer relations plentiful and supportive	Kurtz & Swenson	70. Would rather do something with their hands than book-learning	Kurtz & Swenson
72. Choose friends whose standards of school achievement is also high	Kurtz & Swenson	71. Have limited and vague educational and vocational aims	Kurtz & Swenson
73. Relatively high opinion of themselves	Kurtz & Swenson	72. Hostility is apronounced characteristics (males only)	Shaw & Grubb
74. Exhibit qualities of leadership	Kurtz & Swenson	73. Stronger activity interests as opposed to intellectual (males only)	Terman & Oden
75. Originality and creativity	Kurtz & Swenson Gowan '57	74. Asocial behavior	Gough '55

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
76. Academically inclined, happy in classroom situation	Kurtz & Swenson	75. Unclear and indefinite academic and occupational choice	Gowan '57
77. Derive satisfaction from book-learning	Kurtz & Swenson	76. Weak ego controls	Gowan '57
78. Have high educational and vocational goals	Kurtz & Swenson	77. Withdrawal and self-sufficiency	Gowan '57
79. Relate school work to future goals	Kurtz & Swenson	78. Psychotic and neurotic tendencies	Gowan '57
80. Tend to regard education for more than its job value	Kurtz & Swenson	79. No goal or impossible goals	Gowan '57
81. Doubt and confusion in areas of family and peer acceptance may cause them to strive harder for academic achievement	Ralph Robinowitz	80. Immature, irresponsible	Gowan '57
82. Tend toward stronger intellectual and social interest (males only)	Terman & Oden	81. Disinterest in others	Gowan '57
83. Clear and definite academic/occupational choices	Gowan '57	82. Apathetic withdrawal	Gowan '57
84. Positive character integration	Gowan '57		

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
85. Permissiveness, intraception	Gowan '57		
86. Dominance, persuasiveness	Gowan '57		
87. Enthusiastic, socialized, activity-oriented view of life	Gowan '57 Pierce		
Elementary through High School Subjects			
Males and Females			
88. Emotional maturity positively related to relative achievement	Cohler		
Elementary Subjects			
Male		**Male**	
89. Free to make choices (males only)	Walsh	83. Feel restricted, hemmed in (males only)	Walsh
90. Free to initiate activities (males only)	Walsh	84. Feel helpless (males only)	Walsh
91. Freedom and Adequacy of Emotional Expression (males only)	Walsh	85. Express exaggerated, free-floating emotion or repress all emotion when some emotional response seems appropriate (males only)	Walsh

CHARACTERISTICS OF OVER AND HIGH ACHIEVEMENT	INVESTIGATOR	CHARACTERISTICS OF UNDER AND LOW ACHIEVEMENT	INVESTIGATOR
92. Present feeling of belongingness (males only)	Walsh	86. Feel rejected or isolated (males only)	Walsh
93. Engage in constructive purposive, and resourceful activities (males only)	Walsh	87. Act defensively, either through compliance, evasion or escape, or blind rebellion and negativism. (males only)	Walsh

TABLE A.3

SUMMARY CHARACTERISTICS OF PARENT CHILD RELATIONSHIPS AND GENERAL HOME ENVIRONMENT OF OVER (HIGH) AND UNDER (LOW) ACHIEVERS[1]

CHARACTERISTIC OF OVER (HIGH) ACHIEVERS	INVESTIGATOR	CHARACTERISTIC OF UNDER (LOW) ACHIEVERS	INVESTIGATOR
Male		**Male**	
Mother		**Mother**	
1. Mothers more democratic	Pierce[2]	1. More intrusive	Pierce[2]
2. Mothers of high-achieving males were non-authoritarian	Pierce	2. Close attachment to mother	Kimball '53
3. Mother wants child to do well in competition	Winterbottom	3. Avoidance of mother	Pierce
4. Mother wants son to make own decisions	Winterbottom	4. Mother attempts to accelerate development	Pierce
5. Mother wants son to have interests of his own	Winterbottom	5. Mother suppresses talk of sex	Pierce
6. Mother wants son to be active and energetic	Winterbottom	6. Mother tends to exclude outside influences	Pierce
7. Mother wants son to do well in school	Winterbottom	7. Mother avoids communication	Pierce
8. Mother wants son to show pride in his ability to do well	Winterbottom	8. Mother is very strict	Pierce

[1]Compiled by D. A. Payne

[2]Refer to bibliography for complete citation of research source.

CHARACTERISTIC OF OVER (HIGH) ACHIEVERS	INVESTIGATOR	CHARACTERISTIC OF UNDER (LOW) ACHIEVERS	INVESTIGATOR
9. Wants son to make his own friends	Winterbottom	9. Mother attempts to break childs will	Pierce
10. Mother wants son to be a leader	Winterbottom	10. Mother fosters dependency	Pierce
11. Mother wants son to try difficult tasks for himself	Winterbottom	11. Mother restricts who child will play with	Winterbottom
12. Mother wants son to stand up for his own rights with others	Winterbottom	12. Mother does not let son stay out after dark	Winterbottom
13. Physical demonstration of affection by mother	Winterbottom	13. Approves of activity	Pierce
		Father	
14. Mother most significant contribution to achievement training	Rosen & D'Andrade	14. Poor father-son relationship	Kimball '53
15. Mother warm and accepting yet dominant	Rosen & D'Andrade	15. Negative relationship with father (distant, strict disciplinarian, dominating)	Kimball '53
16. Mother perceived as imposing her standards on son	Rosen & D'Andrade	Mother and Father	
17. Mother rejecting yet empathetic resulting in independence of child	Rosen &	16. Deification	Pierce
		Female	
Father		Mother	
18. Father less rejecting	Rosen & D'Andrade	17. Mother protects her from criticism of father	Malloy

CHARACTERISTIC OF OVER (HIGH) ACHIEVERS	INVESTIGATOR	CHARACTERISTIC OF UNDER (LOW) ACHIEVERS	INVESTIGATOR
19. Father less coercive and pushing	Rosen & D'Andrade	18. Feels family disciplines her more than parents of friends	Malloy
20. Father less dominant	Rosen & D'Andrade	Mother and Father	
21. Father encourages autonomy	Rosen & D'Andrade	19. Family used special rewards to motivate her	Malloy
Male		Male and Female	
Mother and Father		Mother	
22. More freedom and adequacy of emotional expression to parents	Walsh	20. In conflict with mother	Horrall
23. Feeling of belongingness in relation to parents	Walsh	21. Feels unworthy of mother	Horrall
24. Parents coercive	Hoffman, Rosen & Lippitt	22. Mother rejects and scorns offspring	Horrall
25. Encourage autonomy	Hoffman, Rosen & Lippitt	23. Feel inferior to father	Horrall
Female		24. Father more often absent from home	Passow & Goldberg
Mother		Mother and Father	
26. Mothers of high-achieving females very authoritarian	Pierce	25. Parent set no goals or impossible ones	Gowan '57
27. Mothers more strict with their children	Pierce	26. Authoritarian home environment	Gowan '57

CHARACTERISTIC OF OVER (HIGH) ACHIEVERS	INVESTIGATOR	CHARACTERISTIC OF UNDER (LOW) ACHIEVERS	INVESTIGATOR
28. More equalitarian	Pierce	27. Parents dominant, autocratic or laissez-faire	Gowan '57
Father		28. Parent more neutral or uninterested toward education	Barrett
29. Feels understood by father	Malloy	29. Feel hostile because they have not gotten the things in life they'd like from their parents	Shaw & Brown
Mother and Father			
30. Disciplined less frequently than friends	Malloy	30. Little exchange of affection between parent and child	Kurtz
31. No special reward for academic success	Malloy	31. Parents show little pride in them	Kurtz
32. Family fosters independence	Malloy	32. Do not care about pleasing parents	Kurtz
Male and Female			
Mother		33. School achievement of pupils from broken homes inferior to achievement of pupils from normal homes	Curtis and Nemzek
33. Mothers are democratic women	Sheldon		
34. Have mother who were more authoritarian and restrictive in treatment of children	Drews & Teahan		
35. Less conflict about mothers behavior	Horrall '57		
36. Mothers less nurturant	Crandall, Preston & Rabson		

CHARACTERISTIC OF OVER (HIGH) ACHIEVERS	INVESTIGATOR	CHARACTERISTIC OF UNDER (LOW) ACHIEVERS	INVESTIGATOR
37. Direct maternal reward for achievement	Crandall, Preston & Rabson		
38. Less dependent for emotional support	Crandall, Preston & Rabson		
39. High achievement associated with over-protective mother	Levey		
Father			
40. Negative relations with father	Horrall '57		
Mother and Father			
41. Home environment characterized by permissiveness, intraception and creativity	Gowan '57		
42. Doubt and confusion in area of family acceptance cause individual to strive harder for academic achievement	Rabinowitz		
43. Parents show interest, pride and affection to student	Kurtz		
44. Students want to please parent	Kurtz		
45. Respect parents	Kurtz		
46. Parents of high achievers more punitive with respect to child-rearing	Drews & Teahan		

CHARACTERISTIC OF OVER (HIGH) ACHIEVERS	INVESTIGATOR	CHARACTERISTIC OF UNDER (LOW) ACHIEVERS	INVESTIGATOR
47. Parents put tension on child in demanding (the imposition of which are clear and possible to obtain)	Gowan '57		
48. Parents took interest and attempted to motivate student	Gowan '57		
49. Gain acceptance of parents by adhering to their rules	Haggard		
50. Viewed parents as rejecting and generally punitive	Haggard		
51. General negative relationship to parents	Haggard		
52. Saw parents as lacking in emotional warmth	Haggard		
53. Saw parents as over-protective	Haggard		
54. Pressuring for achievement	Haggard		
55. Parents have significantly greater influence on vocational choice	Hopkins, Malleson & Sarnoff		
56. Unsatisfactory interpersonal relationships in family	Dynes, Clarke & Dinity		

APPENDIX B

THE WORD RATING LIST

(Items marked "*" were found to be significant discriminators in cross-validation for males, those marked "#" were significant for females.)

WORD RATING LIST

Following is a list of words teachers may use to describe students. You are to rate yourself on each word as you think your teachers would rate you.

Be sure to describe yourself as your teachers would, not as you would describe yourself.

Read each word carefully, then decide which of the following ratings would be chosen by your teachers to describe you.

Rating Number	Meaning of Number
1	This word would never describe me.
2	This word sometimes describes me.
3	This word usually describes me.
4	This word always describes me.

After you decide how your teacher might rate you, mark the special answer sheet. Use the pencil provided and make heavy marks. Ignore column "5"

Example: 1. Happy 1 2 3 4	1 2 3 4 5 // ■ // // //

This individual has chosen the rating number "2" for the word "happy". This means that he feels that his teachers think that the word "happy" sometimes describes him.

If you have any questions, raise your hand. If not, turn to the next page and begin rating all of the words. Do Not Skip Any Words. Work as rapidly as you can and do not spend too much time on any one word. Remember you are not to use column "5".

Remember you are to rate each of the words as you think your teachers would in describing you.

PLEASE DO NOT WRITE ON THIS BOOKLET

	Never	Sometimes	Usually	Always		Never	Sometimes	Usually	Always
Teachers feel that I am:					Teachers feel that I am:				
*1. patient	1	2	3	4	21. unreliable	1	2	3	4
*,#2. talented	1	2	3	4	*,#22. studious	1	2	3	4
3. dull	1	2	3	4	*,#23. different				
*4. inefficient	1	2	3	4	#24. discontented	1	2	3	4
*,#5. practical	1	2	3	4	25. energetic	1	2	3	4
Teachers feel that I am:					Teachers feel that I am:				
6. clever	1	2	3	4	#26. flighty	1	2	3	4
7. curious	1	2	3	4	27. very active	1	2	3	4
*8. confident	1	2	3	4	28. pessimistic	1	2	3	4
#9. average	1	2	3	4	*,#29. responsible	1	2	3	4
*,#10. logical	1	2	3	4	30. creative	1	2	3	4
Teachers feel that I am:					Teachers feel that I am:				
11. unsuccessful	1	2	3	4	31. a follower	1	2	3	4
*,#12. smart	1	2	3	4	*32. original	1	2	3	4
*,#13. successful	1	2	3	4	*,#33. consistent	1	2	3	4
14. "blah"	1	2	3	4	*,#34. intelligent	1	2	3	4
*15. careful	1	2	3	4	#35. distractable	1	2	3	4
Teachers feel that I am:					Teachers feel that I am:				
*,#16. thorough	1	2	3	4	*36. in-the-know	1	2	3	4
*,#17. orderly	1	2	3	4	37. childish	1	2	3	4
*,#18. purposeful	1	2	3	4	38. decisive	1	2	3	4
*19. uninterested	1	2	3	4	*39. rebellious	1	2	3	4
#20. a procrastinator	1	2	3	4	*,#40. nervous	1	2	3	4

	Never	Sometimes	Usually	Always
Teachers feel that I am:				
*,#41. systematic	1	2	3	4
#42. daring	1	2	3	4
43. cold	1	2	3	4
44. below average	1	2	3	4
*45. reckless	1	2	3	4
Teachers feel that I am:				
46. energetic	1	2	3	4
47. "sharp"	1	2	3	4
*48. dependable	1	2	3	4
49. shrewd	1	2	3	4
*,#50. a person who postpones	1	2	3	4
Teachers feel that I am:				
51. a goof off	1	2	3	4
*,#52. exacting	1	2	3	4
*53. lazy	1	2	3	4
*,#54. stubborn	1	2	3	4
#55. perfectionistic	1	2	3	4
Teachers feel that I am:				
#56. accepting	1	2	3	4
57. persistent	1	2	3	4
58. submissive	1	2	3	4
*,#59. carefree	1	2	3	4
#60. competitive	1	2	3	4

	Never	Sometimes	Usually	Always
Teachers feel that I am:				
61. impulsive	1	2	3	4
62. unreasonable	1	2	3	4
63. dependent	1	2	3	4
64. a "wheel"	1	2	3	4
65. a "grind"	1	2	3	4
Teachers feel that I am:				
66. fool-hearty	1	2	3	4
*,#67. intellectual	1	2	3	4
68. sociable	1	2	3	4
69. retiring	1	2	3	4
70. driven	1	2	3	4
Teachers feel that I am:				
*,#71. alert	1	2	3	4
72. critical	1	2	3	4
73. brilliant	1	2	3	4
74. casual	1	2	3	4
75. adventurous	1	2	3	4
Teachers feel that I am:				
*,#76. above averagw	1	2	3	4
*,#77. productive	1	2	3	4
78. relaxed	1	2	3	4
79. a "brain"	1	2	3	4
80. optimistic	1	2	3	4

Teachers feel that I am:	Never	Sometimes	Usually	Always	Teachers feel that I am:	Never	Sometimes	Usually	Always
#81. persuadeable	1	2	3	4	*,#101. competent	1	2	3	4
82. motivated	1	2	3	4	*102. inconsitent	1	2	3	4
*,#83. a thinker	1	2	3	4	*,#103. teachable	1	2	3	4
84. conforming	1	2	3	4	#104. reasonable	1	2	3	4
*,#85. ambitious	1	2	3	4	105. inquisitive	1	2	3	4
Teachers feel that I am:					**Teachers feel that I am:**				
86. unusual	1	2	3	4	*,#106. impatient	1	2	3	4
87. independent	1	2	3	4	#107. friendly	1	2	3	4
88. determined	1	2	3	4	108. fault-finding	1	2	3	4
*,#89. contented	1	2	3	4	109. reserved	1	2	3	4
90. outsider	1	2	3	4	110. dominant	1	2	3	4
Teachers feel that I am:					**Teachers feel that I am:**				
91. aggressive	1	2	3	4	111. inaccurate	1	2	3	4
92. a person who delays	1	2	3	4	112. touchy	1	2	3	4
93. indecisive	1	2	3	4	*113. passive	1	2	3	4
94. irresponsible	1	2	3	4	114. pushed	1	2	3	4
95. non-critical	1	2	3	4	*,#115. efficient	1	2	3	4
Teachers feel that I am:					**Teachers feel that I am:**				
#96. concerned	1	2	3	4	116. tense	1	2	3	4
*,#97. an achiever	1	2	3	4	*,#117. easily distracted	1	2	3	4
*,#98. a planner	1	2	3	4	*,#118. reliable	1	2	3	4
99. a leader	1	2	3	4	*,#119. serious	1	2	3	4
100. indifferent	1	2	3	4