THE PREDICTIVE EFFICIENCY AND FACTORED DIMENSIONS OF THE MICHIGAN M-SCALES FOR ELEVENTH GRADE NEGRO STUDENTS

AN EXPLORATORY STUDY

Thesis for the Degree of Ph. D.

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Robert Lee Green

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This is to certify that the

thesis entitled

THE PREDICTIVE EFFICIENCY AND FACTORED DIMENSIONS OF THE MICHIGAN M-SCALES FOR ELEVENTH GRADE NEGRO STUDENTS - AN EXPLORATORY STUDY

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Robert Lee Green

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ABSTRACT

THE PREDICTIVE EFFICIENCY AND FACTORED DIMENSIONS OF THE MICHIGAN M-SCALES FOR ELEVENTH GRADE NEGRO STUDENTS AN EXPLORATORY STUDY

by Robert Lee Green

This study was concerned with 1) the predictive efficiency of an objective measure of academic motivation (M-Scales) when applied to a sample of Negro male and female eleventh grade students, 2) a factor analysis of the Negro male responses to a sub-test (Generalized Situational Choice Inventory) of the M-Scales. The results of the study were compared to a similar study based on Caucasian eleventh grade students.

An aptitude measure (SCAT-Verbal), grade point average, and scores on the M-Scales were obtained for each student. Multiple correlations were calculated for each group using an aptitude measure and the M-Scales to estimate GPA. (Because the student's GPA was determined before the analysis was completed, the term "estimated GPA" rather than "predicted GPA" is more appropriate.)

The factor analysis was conducted on the GSCI using the principle axis method of factor extraction and the quartimax method of factor rotation.

For this sample, a significant difference was found between Negro and Caucasian males and females on one sub-test (GSCI) of the M-Scales, with the Negro students achieving higher mean scores. No difference in mean scores was found for the remaining three sub-tests. A significant difference was found in mean GPA between the four groups, with the Caucasian students achieving higher mean scores.

The "t" test of significance from zero for the M-Scale beta weights in estimating GPA was found to be significant for Negro males and females at the .05 level. The SCAT-Verbal did not significantly correlate with GPA for Negro males. The correlation between SCAT-Verbal and GPA for Negro females was significant at the .05 level. In the multiple regression analysis, the M-Scales accounted for most of the variance. The results of the factor analysis indicates that there are elements of motivation that are common to Negro and Caucasian males. However, the elements did not have total overlap. The common factors derived from the two analyses were characterized as 1) chance taking versus no chance taking, 2) n-academic achievement, 3) intrinsicness versus extrinsicness, and 4) situational involvement.

THE PREDICTIVE EFFICIENCY AND FACTORED DIMENSIONS OF THE MICHIGAN M-SCALES FOR ELEVENTH GRADE NEGRO STUDENTS AN EXPLORATORY STUDY

BY

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CHAPTER I

THE PROBLEM

The academic achievement of Negro students represents one of the most pressing problems facing American educators today. The typical Negro student fails to achieve as well,[1,2] drops out of school more frequently,[3] and scores lower on academic aptitude measures than his Caucasian counterpart. While many educators admit in their research that the latter problems exist and are related to the general problem of Negro achievement, few have attempted to determine what specific factors are related to the Negro student's low academic achievement.

In a study relating Negro achievement to social and personality factors, Deutsch[4] acknowledges the significance of the self-concept and certain personality factors. Farquhar,[5] in a comprehensive study

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[1]Leander L. Boykin, "The Reading Performance of Negro College Students." Journal of Negro Education, Vol. 24, 1955, pp. 435-441.

[2]Henry Allen Bullock, "A Comparison of the Academic Achievements of White and Negro High School Graduates." Journal of Educational Research, Vol. 44, 1950, pp. 179-192.

[3]James B. Conant, Slums and Suburbs. McGraw-Hill Book Company, New York, 1961.

[4]Martin Deutsch, "Minority Group and Class Status as Related to Social and Personality Factors in Scholastic Achievement." Society for Applied Anthropology, Monograph Number 2, 1960, pp. 1-32.

[5]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying the 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.

of the motivational factors underlying the achievement of eleventh grade Caucasian high school students, found that the need for academic achievement, self-concept, occupational aspirations and certain personality variables were specific factors related to the general problem of school achievement. A pilot study conducted on the Farquhar data indicates that the same factors play a significant role in Negro school achievement.[6] But, in general, there is a paucity of studies that attempt to assess and predict Negro school achievement using both cognitive and non-cognitive factors. Furthermore, in the past, educational research has been conducted on middle-class, majority group children and the results generalized to all minority children. Deutsch recognizes the latter problem:

> "In general educational concepts and techniques have developed from experiences with majority group children, and have then been generalized with minor modifications, to all children. It is reasonable to suppose that attitudes toward and response to the school situation might also have distinctive characteristics related to environmental conditions and sub-group membership."[7]

This study was an attempt to partially fill the academic void alluded to by Deutsch. Because Negro students comprise a large segment of the school population, an academic vacumn exists in attempting to understand the unique nature of Negro achievement and motivation.

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[6]Robert Lee Green, Unpublished Study conducted on Negro sub-sample of the Farquhar U.S. Office Research Project No. 846 (8458), 1959.

[7]Martin Deutsch, "Minority Group and Class Status as Related to Social and Personality Factors in Scholastic Achievement." Society for Applied Anthropology, Monograph Number 2, 1960, p. 2.

THE STATEMENT OF THE PROBLEM

The problem of the study was two-fold. The primary purpose of the investigation was to study the predictive efficiency of an objective measure of academic motivation (hence referred to as the Michigan M-Scales) when applied to a sample of Negro male and female eleventh grade students. The resulting multiple regression correlation coefficients were compared with an earlier predictive study of the Michigan M-Scales based on Caucasian eleventh grade male and female students.[8]

The secondary purpose of this study was to explore the principal factors which accounted for item intercorrelations in the Generalized Situational Choice Inventory, a sub-test of the Michigan M-Scales. To aid in theory development, the factors derived on the Negro students will be logically compared to those obtained on Caucasian students[9] using the same methodology and instrumentation.

IMPORTANCE OF THE PROBLEM

The task of predicting academic achievement from non-intellectual or personality factors has been difficult. The research of Farquhar[10]

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[8]William W. Farquhar, "The Predictive Efficiency of the Michigan State M-Scales." Paper delivered at the 1962 American Personnel and Guidance Association Meeting, April 18, 1962, Chicago, Illinois.

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

[10]William W. Farquhar, op. cit.

and Chahbazi[11] indicate that when 50% of the variance of the criterion scores is accounted for, researchers consider themselves fortunate. This is especially true if the prediction equation contains new or unique predictors.

Studies predicting academic achievement for Caucasian students are numerous.[12,13] Farquhar, et al., using a Caucasian sample, found that a construct validated non-intellectual measure of academic motivation significantly increases prediction of achievement[14] when added to an aptitude measure. The literature indicates that little research has been done in this same area for Negro students. Plaut[15] and Riessmann[16] found that non-intellectual or personality factors are directly related to the low scholastic achievement of many Negro students. The pilot study conducted on the Farquhar data supports the contention that a

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[11] Parzi Chahbazi, "Use of Projective Tests in Predicting College Achievement." Educational and Psychological Measurement, Vol. 20, 1960, pp. 829-842.

[12] Herbert Hackett, "Use of MMPI Items to Predict College Achievements," Personnel and Guidance Journal, Vol. 39, 1960, pp. 215-217.

[13] Daniel P. Norton, "The Relationship of Study Habits and Other Measures to Achievement in 9th Grade General Science." Journal of Experimental Education, Vol. 27, 1959, pp. 211-217.

[14] William W. Farquhar, op. cit.

[15] Richard L. Plaut, "Variables Affecting Scholastic Achievement of Negro Children in Non-Segregated Schools." Social Problems, Vol. 2, 1955, pp. 207-211.

[16] Frank Riessmann, The Culturally Deprived Child, Harper and Brothers, New York, 1962.

relationship exists between non-intellectual factors and school achievement for Negro students.[17]

The study of Negro academic achievement is important in order to further investigations into causative factors which promote high and low academic achievement. It is obvious that academic achievement is not the only desirable outcome of education. But if Negro students are to participate fully in available advanced academic achievement (college and graduate school) it is imperative that educators more adequately understand the relationship of Negro academic achievement to aptitude and personality factors.

THEORY

McClelland, et al., in attempting to delineate achievement motivation, have postulated that achievement motivation (achievement imagery) is reflected in an individual's responses to selected Thematic Apperception Test cards. Achievement imagery is demonstrated when a subject's responses show concern with (1) long term involvement, (2) unique accomplishment, and (3) competition with a standard of excellence.

Farquhar and associates[18] extended and polarized McClelland's theoretical dimensions by postulating that the other end of the achievement continuum represented (1) short term involvement, (2) common

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[17] Robert Lee Green, op. cit.

[18] William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying the 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.

accomplishment, and (3) competition with a minimal standard of excellence. The assumption was made by Farquhar that McClelland's three variables characterized the person with high need for academic achievement, and the three additonal variables characterized the person with low need for academic achievement.

A summary of the polar theoretical dimensions of academic achievement formulated by Farquhar and associates can be found in Table 1.1.

TABLE 1.1

SUMMARY OF THE POLAR THEORY OF HIGH AND LOW ACADEMIC n-ACHIEVEMENT

High Achievement Motivation	Low Achievement Motivation
1. Long term involvement	1. Short term involvement
2. Unique accomplishment	2. Common accomplishment
3. Competition with a maximum standard of excellence	3. Competition with a minimal standard of excellence

From the polarized dimensional theory of achievement motivation, Farquhar and associates developed an objective measure of academic motivation. Several studies have supported the validity of this instrument as an objective measure of academic motivation.[19]

[19] William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying the 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.

The research of Farquhar, et al., has presented evidence which empirically demonstrates that academic motivation is a personality syndrome composed of the following non-intellectual factors.

1. Need for academic achievement (Generalized Situational Choice Inventory)
2. Self-Concept (Word Rating List)
3. Occupational aspirations (Preferred Job Characteristics Scale)
4. Academic personality factors (The Human Traits Inventory)

The fact that the self-concept, occupational aspirations and certain personality traits are related to achievement motivation is supported by the research of Payne,[20] Taylor[21] and Deutsch.[22] Harrison[23] and Deutsch[24] further indicate that the typical Negro student tends to have a lower academic perception of self, limited range of occupational aspirations and a lower need to achieve academically when compared with the typical Caucasian student.

Deutsch asserts that the unique cultural environment of many Negroes sets up goals which are sometimes coincident with those of the dominant middle class Caucasian culture, but that in general these

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[20] David A. Payne, "The Concurrent and Predictive Validity of an Objective Measure of Academic Self-Concept." Educational and Psychological Measurement, in press, 1962.

[21] Ronald Gail Taylor, "Personality Factors Associated with Eleventh Grade Male and Female Discrepant Achievers." Unpublished Doctoral Dissertation, Michigan State University, 1962.

[22] Martin Deutsch, "Minority Group and Class Status as Related to Social and Personality Factors in Scholastic Achievement." Society for Applied Anthropology, Monograph Number 2, 1960, pp. 1-32.

[23] C. C. Harrison, "Achievement Motivation Characteristics of Negro College Freshmen." Personnel and Guidance Journal, October 1959, pp. 146-149.

[24] Martin Deutsch, op. cit.

goals are divergent and sometimes opposite to those of the Caucasian culture. Hence, the need to strive for middle class Caucasian academic values may not be strong.

The review of the literature indicates a general discrepancy between the academic achievement of Negroes and Caucasians. The lower academic achievement of Negroes would support the contention that Negro students have lower academic motivational levels than Caucasian students.

It is proposed in this study to investigate more fully the relationship between Negro achievement, aptitude and academic motivation. The results of this study will be compared to a similar study[25] conducted on a Caucasian sample investigating the relationship between achievement, aptitude and academic motivation.

THE HYPOTHESES

The hypotheses to be tested in this study are:

1. There is a difference in mean scores on the four sub-tests of the M-Scales between Negro and Caucasian males and females.

2. There is a significant difference in mean scores on the total M-Scales between Negro and Caucasian males and females.

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[25] William W. Farquhar, op. cit.

Because post research indicates that the typical Negro student fails to achieve as well as his Caucasian counterpart,[26,27] the following additional hypothesis will be tested:

3. There is a difference in mean grade point average between Negro and Caucasian males and females.

To assess the predictive efficiency of the M-Scales, the following hypothesis will be tested:

4. The M-Scales when combined with an aptitude measure will increase the precision of prediction of academic achievement (GPA) for Negro males and females.

If the major source of achievement differences between Negro and Caucasian males can be accounted for by the strength of need for academic achievement, these differences should be demonstrated by a factor analysis of the GSCI. The following hypothesis will be tested:

5. There are elements of motivation which are common to Negro and Caucasian males.

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[26] Henry Allen Bullock, "A Comparison of the Academic Achievements of White and Negro High School Graduates." Journal of Educational Research, Vol. 44, 1950, pp. 179-192.

[27] Guy Ferrell, "Comparative Study of Sex Differences in School Achievement of White and Negro Children." Journal of Educational Research, Vol. 43, 1959, pp. 116-121.

ORGANIZATION OF THE STUDY

The general plan of the dissertation is as follows: In Chapter II, a review of the literature which shows the relationship between aptitude, academic motivation and achievement for Negro students is presented. Chapter III is an account of the methodology used in collecting and organizing the data and the statistical techniques employed in analyzing them. The results of the analysis is reported in Chapter IV. The summary, conclusions, and implications for further study appear in the final chapter.

CHAPTER II

REVIEW OF NEGRO ACHIEVEMENT AND MOTIVATION LITERATURE

A review of the literature indicates a paucity of studies exploring the relationship between aptitude, academic motivation and Negro achievement. Most studies of Negro achievement have attempted to either relate intelligence (IQ) to achievement or to compare the Negro student's performance on intelligence or achievement tests to his Caucasian counterpart.

A study by Harrison[1] investigated the relationship of motivational measures to academic achievement. This study was an analysis of the achievement motivational characteristics of a sample of Negro freshmen in a southern college to determine to what extent they were motivated to seek a job. Achievement motivation was reflected by their (1) willingness to become prepared, (2) make sacrifices, and (3) to defer gratification. The instrument used was a modification of the scale developed by Reissman.[2] Harrison's results indicate that 65 per cent of the students indicated that long hours of study would not deter them from going to college, but it was found that only 20 per cent indicated that having to leave their parents would not serve as a detering condition to get a job. The results further indicate that 89 per cent of

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[1] C. C. Harrison, "Achievement Motivation Characteristics of Negro College Freshmen." Personnel and Guidance Journal, October 1959, pp. 146-149.

[2] Leonard Reissman, "Levels of Aspiration and Social Class." American Sociological Review, Vol. 18, 1953.

the subjects were not willing to oppose the wishes of their parents in accepting a job. Harrison also compared the results of his study to Reissman's study that was based on a Caucasian sample. The responses of the two samples were statistically different at the .01 level of significance. Harrison concludes that these indices of low achievement motivation take on special significance for non-whites because economic opportunities are broadening. He recommends that parents of youths similar to those included in his study should stress independence of action and competition with a standard of excellence.

Harrison's sample should be given careful examination. The majority of the subjects (716 males and females) were of rural and working class origin from the southern area of the United States. Because his subjects do not comprise a representative sample of Negro students, generalizations about Negro students from non-southern, non-rural backgrounds are unwarranted.

Ferrell[3] conducted a study to determine if there was a significant sex difference in abilities and achievement among 300 Negro students. The variables studies were language usage, arithmetic computation, social studies and elementary science. Ferrell reports that language usage was the only variable that was statistically significant (critical ratio of 2.76) between Negro males and females. With an identical number of students (300), the male-female differences among Caucasians

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[3] Guy V. Ferrell, "Comparative Study of Sex Differences in School Achievement of White and Negro Children." Journal of Educational Research, Vol. 51, 1959, pp. 116-121.

were practically the same. On all four variables, the mean achievement scores of the Caucasian students were higher than the mean achievement scores of the Negro students. Although by inspection the differences are plausably significant, no test of significance between mean achievement scores was reported. In Table 2.1 is contained the mean scores obtained from measuring the achievement of the two groups, using form H of the Stanford achievement test.

TABLE 2.1

MEAN ACHIEVEMENT SCORES OF NEGRO AND CAUCASIAN STUDENTS BASED ON FORM H OF THE STANFORD ACHIEVEMENT TEST

Sub-test	Caucasian Students		Negro Students	
	Boys	Girls	Boys	Girls
Language	46.1	50.6	32.7	34.8
Arithmetic	47.5	48.8	39.4	38.8
Social Studies	44.8	43.2	36.7	35.7
Science	47.6	47.8	32.9	35.1

A comprehensive study of ethnic differences in mental growth and school achievement was conducted by Osborne.[4] Eight hundred and fifteen

[4] O. T. Osborne, "Racial Differences in Mental Growth and School Achievement: A Longitudinal Study." Psychological Reports, Vol. 7, 1960, pp. 233-239.

Caucasian children and 446 Negro children comprised the sample. The testing was conducted in 1954, 1956 and 1958 when the children were in grades 6, 8 and 10, respectively. It was found that Negro-Caucasian achievement differences of almost two years at grade 6 increased steadily until at grade 10 the reading achievement difference exceeded three grades. The increased difference in achievement was apparent on the Vocabulary Sub-test, Comprehension Sub-test and Total Reading Scale Sub-test of the California achievement tests. The trend for lower achievement scores found among Negro children was attributed to poor early environments and limited educational opportunities. In his conclusions, Osborne states that there is a need for research to explore developmental and motivational factors which may be related to achievement differences between Negro and Caucasian children.

Bullock,[5] in a study of freshman college students who were attending Texas colleges for the first time in 1947, found pronounced achievement test differences between Negroes and Caucasians. The test used was the Iowa High School Content Examination which measures achievement in four areas: English Literature, Mathematics, Science, History and Social Studies. On a total score based on four composite standard scores, it was found that 98 per cent of the Negro students fell below the median score of the Caucasian students, who were quite similar in age, sex, socioeconomic background and residence area to the normative

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[5] Henry Allen Bullock, "A Comparison of the Academic Achievements of White and Negro High School Graduates." Journal of Educational Research, Vol. 44, 1950, pp. 179-192.

sample of the test. The author concludes that, if we assume equality of academic aptitude, Negro students achieve less well than Caucasian students.

Boykin,[6] in a study investigating the reading achievement of 596 Negro college students, found that his sample read "about two-thirds as well as the groups on which the test was standardized." Because the sample in Boykin's investigation was composed only of southern Negro college students, generalizations from his sample cannot readily be made.

Deutsch[7] conducted a study investigating the effects of racial background and social class membership on the school achievement of Negro and Caucasian elementary school students. It was found that teachers reinforce negative self-images of Negro students by their verbal behavior in the classroom. This negative reinforcement establishes avoidance motives about school in these students. The expectations of many students in Deutsch's sample were those of cold and rejecting academic environments.

The schools investigated were not synchronized with the Negro student's experiences. Deutsch states: "The orientation of our schools is almost entirely toward middle class values and way of life, which sometimes have no concrete meaning for the lower class child."[8]

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[6]Leander L. Boykin, "The Reading Performance of Negro College Students." Journal of Negro Education, Vol. 24, 1955, pp. 435-441.

[7]Martin Deutsch, "Minority Group and Class Status as Related to Social and Personality Factors in Scholastic Achievement." Society for Applied Anthropology, Monograph Number 2, 1960.

[8]Ibid., p. 28.

It was not surprising from other indices of social disorganization found by Deutsch, such as broken homes and crowding ratio's, that reading and arithmetic scores of the Negro students were significantly lower than those of the Caucasian groups and that these students had a more negative self-image.

Although some effort was made to control for social class influences, equality of status was probably not achieved due to a lack of comparability of samples.

Rosen,[9] in a study examining the differences in motivation, values and achievement aspirations of six racial and ethnic groups, including French-Canadian, Italian, Greek, Jewish, Negro and Caucasian-Protestant, found results that indicate that achievement motivation is more characteristic of Greeks, Jews and Caucasian-Protestants than of Italians, French-Canadians, and Negroes. Although the Negro sample had the lowest mean in motivation and a low vocational aspiration score, the sample's educational aspiration scores were much higher than expected, being comparable to those of the Jews, Greeks and Caucasian-Protestants, and higher than those of the Italians and French-Canadians. In examining the aspirations of Negroes, Rosen is unable to reconcile the low mean motivation and vocational scores, with the high mean educational aspiration score.

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[9]Bernard C. Rosen, "Race, Ethnicity, and the Achievement Syndrome." American Social Review, Vol. 24, 1960, pp. 47-60.

SUMMARY

Few studies exploring the relationship between aptitude, academic motivation and Negro achievement have been reported. Harrison found that Negro students demonstrated low indices of achievement motivation when compared with Reissman's Caucasian sample. Osborne found that achievement differences between Negro and Caucasian students increased as they progressed from grades six through ten. Bullock found that 98 per cent of the Negro students in his sample fell below the median achievement score of the Caucasian students.

Of the studies reported, some are open to criticism concerning a lack of statistical tests of significance and adequate sampling. In the present investigation, an attempt will be made to build on the strengths of past research and to overcome their limitations.

CHAPTER III

DESIGN AND METHODOLOGY

The general design and methodology of this study is described under the following headings: (1) Sample Selection, (2) Instrumentation, and (3) Analysis Procedures.

Sample Selection

Within this study, two samples must be defined. The Negro sample consisted of 104 males and 129 females selected from a population of 700 eleventh grade students from two Michigan high schools.

The Caucasian sample of 254 males and 261 females was part of a larger project conducted by Farquhar.[1] The sample was selected from a larger sample of 4200 eleventh grade students from nine Michigan high schools.

The Caucasian male sample for the factor analysis also was part of the larger Farquhar study.[2] The sample consisted of 308 individuals. The Negro male sample for the factor analysis consists of the same individuals upon which the correlational analysis was conducted.

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[1]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying the 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]Marion D. Thorpe, "The Factored Dimensions of an Objective Inventory of Academic Motivation Based on Eleventh Grade Male Over- and Underachievers." Unpublished Doctoral Dissertation, Michigan State University, 1961.

The sample sizes may be summarized as follows: (1) for the correlational analysis, there were 104 and 254 Negro and Caucasian males and 129 Negro and 261 Caucasian females; (2) for the factor analysis, there were 104 Negro and 308 Caucasian males.

Instrumentation

The following data were gathered on each student: (1) aptitude score, (2) grade point average, and (3) motivational score.

Aptitude Score

Because of its availability for all individuals in the sample, the verbal form of the School and College Ability Test (SCAT) was used as the aptitude measure. A full description of the SCAT may be found in the manual.[3]

Grade Point Average

Grade Point Average (GPA) was computed for each individual using ninth and tenth grade subjects. Only academic subjects were included, i.e., those requiring homework.

Motivational Score

The objective measure of motivation was the Michigan M-Scale. This scale consists of four sub-tests: (1) Generalized Situational

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[3]Educational Testing Service, School and College Ability Test Manual, Princeton, New Jersey, 1961.

Choice Inventory, (2) Word Rating List, (3) Human Traits Inventory, and (4) Preferred Job Characteristics Scale.[4]

Using a sample of fifty Negro males, a Hoyt's analysis of variance reliability estimate of .96 for the total scale was obtained. A sample of fifty Negro females yielded a comparable reliability estimate of .97 for the total scale indicating that the total scale reliability was acceptable. The reliability estimates of all sub and total scores are reproduced in Table 3.1. Except for the male HTI (.02), the reliability estimate for the sub-scales attain a satisfactory level (.70 to .98). The mean, standard deviation and distribution of scores for the male HTI sample are reproduced in Figure 3.1. Inspection of Figure 3.1 indicates a distribution with little variance. The majority of the scores cluster around 13, 14 and 16, yielding a mean of 13.82 and a standard deviation of 2.16. On the basis of these results, the HTI does not appear to be reliable for Negro males.

Analysis Procedures

A multiple regression analysis was performed predicting Grade Point Average (GPA) as a function of the (1) Word Rating List (WRL), (2) Generalized Situational Choice Inventory (GSCI), (3) Human Traits

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[4]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying the 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.

TABLE 3.1

SUMMARY OF HOYT'S ANALYSIS OF VARIANCE
RELIABILITY ESTIMATES FOR THE M-SCALES

Sub-Test	N	Negro Males Reliability Estimate	Negro Females Reliability Estimate
GSCI[1]	50	.78	.71
WRL[2]	50	.86	.91
PJCS[3]	50	.98	.83
HTI[4]	50	.02	.70
M-Scale Total	50	.96	.97

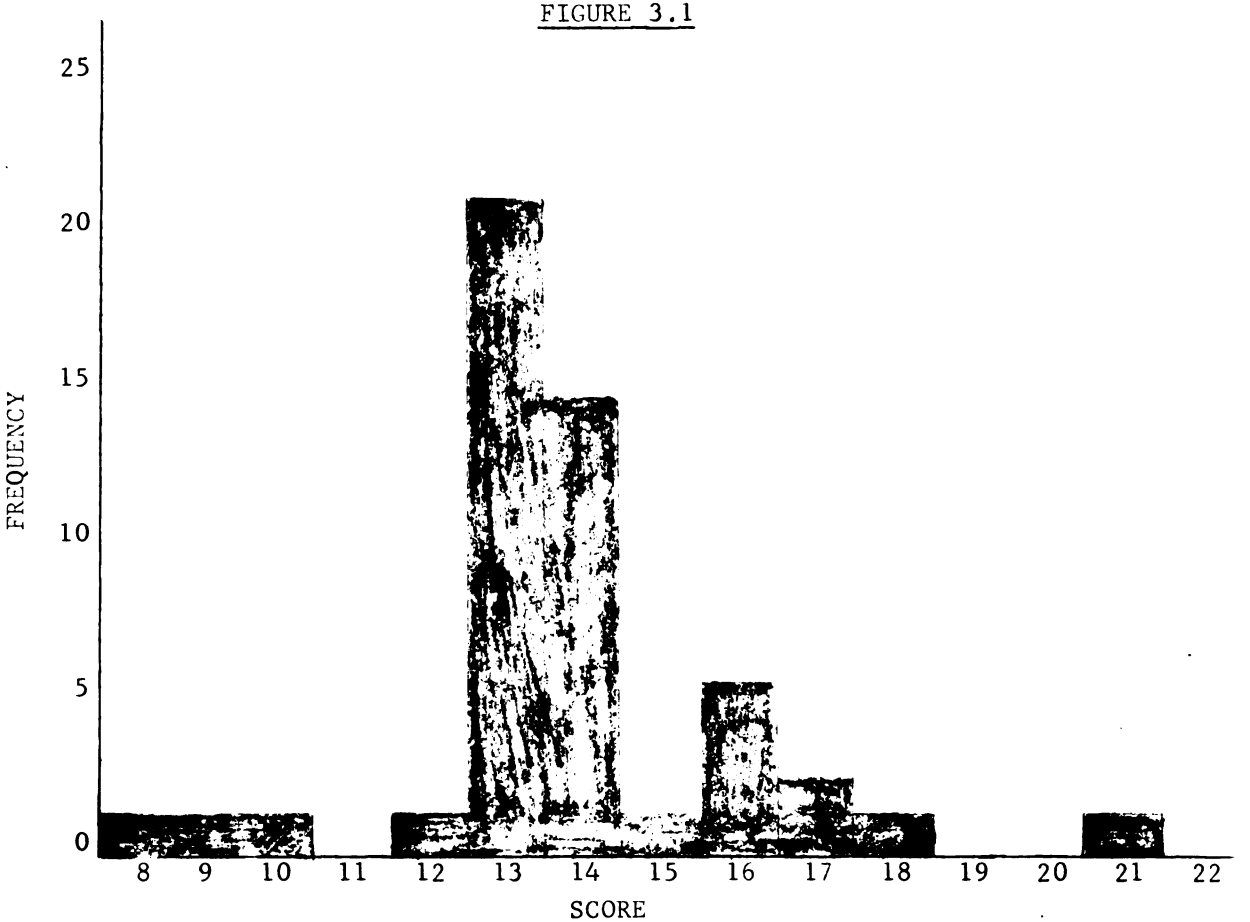
[1]Based on 45 items for males and 30 items for females

[2]Based on 48 items for males and 48 items for females

[3]Based on 20 items for males and 33 items for females

[4]Based on 26 items for males and 33 items for females

FIGURE 3.1



Distribution of Scores for Male HTI Sample of 50 for which the reliability estimate was conducted.

Inventory (HTI), (4) Preferred Job Characteristics Scale (PJCS), and (5) School and College Ability Test-Verbal Form, (SCAT-V).

The multiple regression equations were solved using the general linear hypothesis and least squares estimates of the β's. The method is outlined in Kempthorne's Design and Analysis of Experiments.[5] The analysis was done on the Michigan State University high speed digital computer, MISTIC, with a K-16M program. For the purpose of the model the assumption is made that a multivariate-normal population has been sampled.

Mean Test of Significance

The students t was employed to test the mean differences between Negro and Caucasian responses to the Michigan M-Scales. The method is outlined in Walker and Lev, Statistical Inference.[6] For the purposes of this study, it was assumed that a normal population of eleventh grade students were sampled.

Factor Analysis

A factor analysis of the Negro males' responses to 22 selected items of the GSCI was conducted and compared with an earlier factor analysis of the same items by Thorpe on a group of eleventh grade

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[5]Oscar Kempthorne, Design and Analysis of Experiments, John Wiley and Sons Book Company, New York, 1952.

[6]Helen M. Walker and Joseph Lev, Statistical Inference, Henry Holt and Company, New York, 1953.

Caucasian males.[7] In order to compare factors derived from the two analyses, the same factor analytic solution employed by Thorpe, was used in this study. The entire sub-scale (45 items) was also factor analyzed in order to grasp a fuller understanding of the underlying structure of the GSCI.

Procedure

1. After building two response matrices (22 x 108 and 45 x 108), the intercorrelation among the items were obtained, using a M 23 M program.[8]
2. The principle axis solution was employed to factorize the matrix, using an M 20 M program.
3. The factors were rotated to simple structure by the quartimax method of factor rotation. The K-11 program was used for this analysis.

NULL HYPOTHESES

For the present design, the hypotheses will be restated in null form, i.e., the hypothesis that there is no true difference between the two groups in relation to the criterion.

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[7]Marion D. Thorpe, op. cit.

[8]The entire analysis was performed by the Michigan State University high speed digital computer, MISTIC.

Ho_1 There is no significant difference in mean scores on the four sub-tests of the M-Scales between Negro and Caucasian males and females.

Ho_2 There is no significant difference in mean scores on the total M-Scales between Negro and Caucasian males and females.

Ho_3 There is no significant difference in mean grade point average between Negro and Caucasian males or females.

Hypotheses four and five will not be stated in null form.

Ho_4 The M-Scales when combined with an aptitude measure will increase the precision of prediction of academic achievement (GPA) for Negro males and females.

Ho_5 There are elements of motivation which are common to Negro and Caucasian males.

SUMMARY

A Negro sample of eleventh grade students was drawn from two large Michigan high schools. A design based on correlational and factor analysis was employed to study the predictive efficiency and factored dimensions of an objective measure of academic motivation (the Michigan M-Scale). The results obtained from this analysis were compared with the results obtained from the Farquhar study based on eleventh grade Caucasian students.[9]

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[9]William W. Farquhar, op. cit.

CHAPTER IV

STATISTICAL ANALYSIS

This chapter is concerned with the analysis of (1) the mean tests of significance between Negro and Caucasian male and female responses to the four sub-tests of the M-Scales; (2) correlational and multiple regression analysis to assess the relationship among the M-Scales and the SCAT-Verbal score; and (3) factor analysis of the Negro male's responses to the GSCI.

Difference Between Negro and Caucasian Scores

The null hypothesis tested for each sub-test of the M-Scales was:

> Ho_1 There is no difference in either the Generalized Situational Choice Inventory, Word Rating List, Human Traits Inventory, or Preferred Job Characteristics Scale scores between Negro and Caucasian males or females.

A summary of the means, standard deviations, and t-tests between Negro and Caucasian males and females are presented in Tables 4.1 and 4.2, respectively. Inspection of Tables 4.1 and 4.2 indicate that for the GSCI the Negro male and female mean scores of 33.48 and 21.70 respectively are higher than the Caucasian male and female mean scores of 30.76 and 20.45. The obtained t-ratios of -3.840 for males and -2.910 for females are significant at the .05 level. Therefore, the null

hypothesis of no difference is rejected for this sub-test. For the remaining three sub-tests, the null hypothesis was accepted for both sexes.

Ho_2 There is no difference in mean scores on the total M-Scale between Negro and Caucasian males and females.

The t-ratios of 1.710 for males and .360 for females are not significant at the .05 level. Therefore, the null hypothesis for the total M-Scale was accepted.

Ho_3 There is no difference in mean GPA between Negro and Caucasian males or females.

The Caucasian male and female mean scores of 2.94 and 3.27 respectively are higher than the Negro male and female mean scores of 2.67 and 2.77. The obtained t-ratios of 3.214 for males and 5.620 for females are significant at the .05 level. Therefore, the null hypothesis of no difference in GPA is rejected.

Correlational Analysis

The intercorrelations of the sub-scales with each other and with GPA are presented in Tables 4.3 and 4.4. Inspection of Tables 4.3 and 4.4 reveals that the correlations between M-Scales and aptitude are low, especially for males. The correlations between aptitude and GPA are low. However, the correlations between M-Scales and GPA are all significantly different from zero, except for the male HTI.

TABLE 4.1

MEANS, STANDARD DEVIATIONS AND t-TESTS BETWEEN CAUCASIAN AND NEGRO MALES

VARIABLE	TOTAL POSSIBLE SCORE	CAUCASIAN (N=254) MEAN	S.D.	NEGRO (N=104) MEAN	S.D.	d.f.	t
Grade Point Average	5.00	2.94	.72	2.67	.74	356	3.214**
GSCI	45	30.76	6.89	33.48	5.67	356	-3.840
HTI	26	18.97	4.41	19.41	3.96	356	- .938
PJCS	20	16.20	4.32	16.63	3.95	356	-1.010
WRL	48	30.41	9.69	30.54	8.58	356	- .125
Total M-Scales	139	96.39	20.01	100.03	17.44	356	-1.710

** p .05

Significant differences in GSCI and GPA

TABLE 4.2

MEANS, STANDARD DEVIATIONS AND t-TESTS BETWEEN CAUCASIAN AND NEGRO FEMALES

VARIABLE	TOTAL POSSIBLE SCORE	CAUCASIAN (N=261) MEAN	S.D.	NEGRO (N=129) MEAN	S.D.	d.f.	t
Grade Point Average	5.00	3.27	.66	2.77	.86	388	5.620**
GSCI	30	20.45	5.11	21.70	4.57	388	-2.910**
HTI	25	17.51	3.60	17.10	4.25	388	.938
PJCS	33	27.44	5.78	27.42	6.05	388	.031
WRL	48	28.99	8.29	27.33	9.58	388	1.680
Total M-Scales	136	94.93	18.69	94.22	18.09	388	.360

** p .05

Significant differences in GSCI and GPA

TABLE 4.3

INTERCORRELATIONS AMONG ACHIEVEMENT, APTITUDE AND M-SCALE SUB-TESTS FOR NEGRO MALES (N = 104)

	GSCI	PJCS	WRL	HTI	SCAT-V	GPA
GSCI		.70*	.36*	.41*	.06	.26*
PJCS			.42*	.40*	.04	.30*
WRL				.57*	-.02	.36*
HTI					-.02	.14
SCAT-V						-.01

* P .05 for the test that r = 0, if r .195, at the .05 level

The male sub-scales correlate from .36 to .70 with each other. The female sub-scale intercorrelations range from .43 to .70. The intercorrelations of the sub-scales for both sexes appear to be fairly comparable. This finding tends to corraborate earlier analyses with Caucasians.[1] The correlation between M-Scale total and GPA was .56 for females and .37 for males.

[1]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying the 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.

TABLE 4.4

INTERCORRELATIONS AMONG ACHIEVEMENT, APTITUDE AND M-SCALE SUB-TESTS FOR NEGRO FEMALES (N = 129)

	GSCI	PJCS	WRL	HTI	SCAT-V	GPA
GSCI		.70*	.57*	.52*	.19*	.46*
PJCS			.43*	.45*	.12	.34*
WRL				.59*	.18*	.64*
HTI					.10	.40*
SCAT-V						.25*

* P .05 for the test that r - 0, if r .174, at the .05 level

Multiple Regression Analysis*

The hypothesis for the multiple regression analysis was:

Ho_4 The Michigan State M-Scales when combined with an aptitude measure will increase the precision of prediction of academic achievement (GPA) for Negro males and females.

The multiple regression equation predicting GPA from the SCAT-Verbal plus the four sub-scales of the M-Scales may be found in

* Because the SCAT-Verbal correlates very low with GPA for Negro males (-.01), it ordinarily would not have been incorporated into a multiple regression equation predicting GPA for the Negro male sample. However, the statistical program for the regression analysis automatically gives this information.

Table 4.5. For males, the optimum weighting produced a multiple correlation of .42 and for females .66.

TABLE 4.5

FIVE VARIABLE PREDICTIONS OF ACHIEVEMENT CRITERION WITH MULTIPLE CORRELATIONS AND CORRESPONDING BETA WEIGHTS FOR NEGRO MALES AND FEMALES

	BETA WEIGHTS	MULTIPLE R
Males (N=104)	.1411(GSCI) + .2745(PJCS) + .3066 (WRL) + -.3223(HTI) + -.0002(SCAT-Verbal)	= .42
Females (N=129)	.2381(GSCI) + .0047(PJCS) + .4864(WRL) + .0149(HTI) + .0018(SCAT-Verbal)	= .66

The beta weights for aptitude in both males and females are not significantly different from zero. The beta weights for M-Scales are significant for both males and females. The t-beta's were as follows:

Males -- GPA = 1.184 + .157*(M-Scales)+ -.003(SCAT-V)
t-beta = 7.31, $P < .05$ for test that $\beta = 0$.

Females -- GPA = 3.76 + .248*(M-Scale) + .032(SCAT-V)
t-beta = 7.31, $P < .05$ for test that $\beta = 0$.

Thus, the M-Scales significantly increases prediction of academic achievement (GPA) for Negro males and females. Also, the M-Scales appear to be a more valid predictor of GPA for Negroes than the SCAT-Verbal.

Factor Analysis

For the 22 and 45 variable problems, the principle axes method of factor extraction was used. The results of the principle axes solution were rotated to simple structure using the quartimax orthogonal method of factor rotation. For the 22 variable problem, each factor had to have at least two items loading highest across rows in order to be considered a factor. The latter criterion was adhered to in order to approximate Thorpe's criterion in his 22 variable problem.[2] For the 45 variable problem, each factor had to have at least three items loading highest across rows in order to be considered a factor. The latter criterion suggested by Kiel[3] provides for a more meaningful factor interpretation.

The hypothesis for the 22 variable factor analysis was:

Ho_5 There are elements of motivation which are common to Negro and Caucasian males.

Results of 22 Variable Factor Analysis

In his 22 variable problem conducted on eleventh grade Caucasian males, Thorpe found that five factors accounted for most of the variance among the items. The five rotated factors were described as 1) chance

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

[3]Donald Kiel, Personal Communication, Computer Center, Michigan State University.

taking versus no chance taking, 2) n-academic achievement, 3) intrinsicness versus extrinsicness, 4) speed versus thoroughness, and 5) situational involvement.

In the 22 variable problem conducted on eleventh grade Negro males, it was found that four factors accounted for most of the variance among the items. The items, their content and their loadings are presented in Tables 4.6 through 4.9. Each item was responded to by the examinee on the basis of "I would prefer to."

The content of the items loading on Factor I appears to approximate Factor I (chance taking versus no chance taking) of Thorpe's data.[4] Items 38 and 39 are similar in meaning although the wording is different. The slight difference (.138) between the loadings suggests that the items are functioning in a similar manner.

Items 59, 55 and 11 loaded highest on Factor II. These items appear to be concerned with time involvement, accomplishment and competition. Although the loadings on items 18, 36 and 41 do not approximate the loadings on the three highest items, they also suggest components of accomplishment and competition. Items 11, 18, 55, and 59 were the same items which loaded highest on Thorpe's second factor. In general, Factor II appears to be very similar to Factor II in Thorpe's data and will also be characterized as an n-academic achievement factor.

Three items (66, 77 and 13) loaded highest on Factor III. Items 66 and 77, which loaded the highest on Factor III, were the same items which loaded highest on Thorpe's third factor. Item 13 (which accounts

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[4] Marion D. Thorpe, op. cit.

TABLE 4.6

FACTOR I*

Item Number and Content	Loading
39. a) Receive a grade on the basis of how much my teacher thinks I have learned, or	
b) Take a course from an instructor who only gives "C"'s	+.568
38. a) Have everybody in the class get a "C" at the beginning of the course, or	
b) Be graded at the end of the course with the possibility of getting a higher or lower mark	+.430
44. a) Study my assignments during study hall, or	
b) Wait to study until the mood strikes me	+.422
16. a) Be successful in finishing a job, or	
b) Finish a job	+.419

* Tables 4.6, 4.7, 4.8 and 4.9 pertain to the 22 item factor analysis.

TABLE 4.7

FACTOR II

Item Number and Content	Loading
59. a) Study to go to college, or	
b) Study to get out of high school	-.686
55. a) Wait until I had finished college and make a better salary, or	
b) Get a job right after high school and make a good salary	-.651
11. a) Be well prepared for a job after graduation from high school, or	
b) Be well prepared to continue learning	-.603
36. a) Have a great deal of money, or	
b) Be an expert in my favorite school subject	-.384
41. a) Be paid for the <u>amount</u> of work I did, or	
b) Be paid by the hour	-.372
18. a) Get excellent grades because I have a great deal of ability, or	
b) Get average grades because I have average ability	-.364

for the least amount of the variance) seems to bring in the chance taking versus no chance taking element. However, when viewed in totality, Factor III seems to approximate Thorpe's intrinsicness versus extrinsicness dimension.

Two items (9 and 46) loaded highest on Factor IV. Item 9, which had the highest loading (.612), seems to be concerned with school versus non-school orientation. Thought versus action seems to characterize item 46. In general, Factor IV appears to approximate Factor V of Thorpe's data and is viewed as a situational involvement factor.

The hypothesis predicted that there were elements of motivation which were common to Negro and Caucasian males. Factors I, II, III and IV appear to be very similar to Factors I, II, III and V in Thorpe's data based on Caucasian males. Factor III has items that characterize certain aspects of Thorpe's third factor, but it also contains an additional dimension which indicates that it is somewhat unique when compared to the third and remaining factors in Thorpe's data. On the basis of the results of this analysis, the hypothesis that there are elements of motivation which are common to Negro and Caucasian males seems tenable. However, the implications are that a replication study which includes new dimensions from the ones Thorpe's thesis is based on may yield unique factors not found in the present study.

Results of 45 Variable Factor Analysis

The results of the 45 variable analysis indicate that five factors account for most of the variance among the items. The items, their

TABLE 4.8

FACTOR III

Item Number and Content	Loading
66. a) Be very happy, or	
b) Have lots of money	-.640
77. a) Discover a gold mine, or	
b) Discover a new medicine	-.492
13. a) Have the teacher give everyone the same grade at the beginning of the term and know I had passed, or	
b) Take chances on getting a higher or lower grade at the end of the course	-.447

TABLE 4.9

FACTOR IV

Item Number and Content	Loading
9. a) Have the best teachers in the state in my school, or	
b) Have a large recreation center in my school	+.612
46. a) Think of an idea that nobody has ever thought of, or	
b) Set a world's speed record	+.399

content and their loadings are reproduced in Tables 4.10 through 4.14.

Seven items loaded highest on Factor I. Items 55, 52 and 59 account for most of the variance for this factor. The content of the latter three and remaining four items place a heavy emphasis upon the "time" element in relation to achieving specific goals. In general, this item is characterized by short term versus long term involvement.

Five items loaded highest on Factor II. Items 13 and 38 of this factor loaded highest on Factor I of Thorpe's data. Considering the items with the highest loadings (38, 13 and 39) chance taking versus no chance taking seems to describe this item.

The content of the items loading highest of Factor III appear to represent an accomplishment dimension. Referring to the theoretical dimensions of Table 1.1, it seems feasible that one alternative on each of the items is associated with the need for unique accomplishment, and the other alternative associated with the need for common accomplishment. In general, unique versus common accomplishment seems to characterize this item.

Three items loaded highest on Factor IV. Items 9 and 78 indicate a materialism versus non-materialism dimension. Item 70 seems to contain the element of accomplishment. However, when viewed in totality, materialism versus non-materialism appears to characterize this factor.

Five items loaded highest on Factor V. Items 15, 71 and 44 are concerned with academic interest or general school orientation. Time involvement seems to characterize items 77 and 53. In general, academic interest versus non-academic interest characterized Factor V.

TABLE 4.10

FACTOR I*

Item Number and Content	Loading
55. a) Wait until I had finished college and make a better salary, or	
b) Get a job right after high school and make a good salary	+.651
52. a) Work overtime to make more money, or	
b) Get more schooling to make more money	+.640
11. a) Be well prepared for a job after graduation from high school, or	
b) Be well prepared to continue learning	+.616
59. a) Study to go to college, or	
b) Study to get out of high school	+.603
18. a) Get excellent grades because I have a great deal of ability, or	
b) Get average grades because I have average ability	+.429
56. a) Plan my life in advance, or	
b) Live my life from day to day	+.427
27. a) Do as well as most of my classmates, or	
b) Do better than most of my classmates	+.406

* Tables 4.10, 4.11, 4.12, 4.13 and 4.14 pertain to the 45 item factor analysis.

TABLE 4.11

FACTOR II

Item Number and Content	Loading
38. a) Have everybody in the class get a "C" at the beginning of the course, or	
b) Be graded at the end of the course with the possibility of getting a higher or lower mark	+.658
13. a) Have the teacher give everyone the same grade at the beginning of the term and know I passed, or	
b) Take chances on getting a higher or lower grade at the end of the course	+.623
39. a) Receive a grade on the basis of how much my teacher thinks I learned, or	
b) Take a course from an instructor who only gives "C"'s	+.486
9. a) Have the best teachers in the state in my school, or	
b) Have a large recreation center in my school	+.443
64. a) Carry out the plans of others, or	
b) Create something of my own	+.362

TABLE 4.12

FACTOR III

Item Number and Content	Loading
24. a) Complete a job which I recognize as difficult, or	
b) Complete a job which other's recognize as difficult	-.481
18. a) Get excellent grades because I have a great deal of ability, or	
b) Get average grades because I have average ability	-.416
30. a) Be known as a person with much ability, or	
b) Be known as a person with adequate ability	-.367
20. a) Make quick decisions and sometimes be right and sometimes wrong, or	
b) Deliberate over decisions and usually be right	+.352

TABLE 4.13

FACTOR IV

Item Number and Content	Loading
78. a) Have one of my children win a beauty contest, or	
b) Have one of my children win a college scholarship	+.535
70. a) Put together a new object, or	
b) Develop new ideas	-.518
9. a) Have the best teachers in the state in my school, or	
b) Have a large recreation center in my school	-.362

TABLE 4.14

FACTOR V

Item Number and Content	Loading
77. a) Discover a gold mine, or	
b) Discover a new medicine	+.552
15. a) Receive money for my good grades, or	
b) Be allowed to take any course I wanted because of good grades	+.453
71. a) Be demanding on myself to do good work, or	
b) Be demanding on my friends so that they will do good work	+.395
44. a) Study my assignments during study hall, or	
b) Wait to study until the mood strikes me	+.387
53. a) Inherit a great deal of money, or	
b) Earn a great deal of money	+.363

The results of the 45 variable factor analysis logically supports the results of the 22 variable factor analysis. The two analyses presented factors that contained similar elements and the 45 variable factor analysis increased the conceptual understanding of the GSCI.

SUMMARY

A significant difference was found between Negro and Caucasian males and females on the GSCI with the Negro students achieving higher mean scores. No difference in mean scores was found for the remaining three sub-tests. A significant difference was not found in mean scores for the total M-Scales between Negro and Caucasian males and females.

The significance from zero test for beta weights for the M-Scales in predicting GPA was found to be significant for Negro males and females at the .05 level. The SCAT-Verbal did not significantly correlate with GPA for Negro males (-.01). The correlation between SCAT-Verbal and GPA for Negro females (.25) was significant at the .05 level. In the multiple regression analysis, the M-Scales accounted for most of the variance.

The results of the 22 variable factor analysis supported the hypothesis that there are elements of motivation that are common to Negro and Caucasian males. The results of the 45 variable factor analysis logically supported the results of the 22 variable factor analysis. The labeling of the factors from the three analyses are reproduced in Table 4.15.

TABLE 4.15

SUMMARY OF FACTORS FOR THE 22 AND 45 ITEM FACTOR ANALYSES

Caucasian Males	Negro Males	
22 Item Analysis	22 Item Analysis	45 Item Analysis
1. Chance taking versus no chance taking	1. Chance taking versus no chance taking	1. Short-term versus long-term involvement
2. N-academic achievement	2. N-academic achievement	2. Chance taking versus no chance taking
3. Intrinsicness versus extrinsicness	3. Intrinsicness versus extrinsicness	3. Unique versus common accomplishment
4. Speed versus thoroughness	4. Situational involvement	4. Materialism versus non-materialism
5. Situational involvement		5. Academic interest versus non-academic interest

CHAPTER V

SUMMARY

The major purpose of this investigation was to study the predictive efficiency of an objective measure of academic motivation (the M-Scales) when applied to a sample of Negro male and female eleventh grade students. The results of the investigation were compared with an earlier predictive study of the M-Scales based on Caucasian eleventh grade male and female students.[1]

The secondary purpose of this study was to explore the principle factors which accounted for item intercorrelations in the GSCI. The factors derived on the Negro males were logically compared to those obtained on Caucasian males in an earlier investigation.[2]

An aptitude measure, GPA, and scores on the M-Scales were obtained for each student. A test of significance was computed between Negro and Caucasian males and females for each sub-test of the M-Scale, the M-Scale total score and GPA. Scores on each sub-test of the M-Scales

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[1]William W. Farquhar, "The Predictive Efficiency of the Michigan State M-Scales." Paper delivered at the 1962 American Personnel and Guidance Association Meeting, April 18, 1962, Chicago, Illinois.

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

were correlated 1) with each other, 2) with the aptitude score, and 3) with GPA for males and females. Multiple correlations were calculated for each group using an aptitude measure and the M-Scales to estimate GPA. Also, a multiple regression equation was computed for both groups. A "t" test of beta weights was used to determine if each variable was significantly different from zero.

The factor analysis was conducted on the GSCI using the principle axis method of factor extraction and the quartimax method of factor rotation.

It was found that a significant difference existed between Negro and Caucasian males and females on the mean GSCI scores, with Negro students achieving higher mean scores. No difference in mean scores was found in mean GPA scores between the four groups, with the Caucasian students achieving higher mean scores.

The "t" test of significance from zero for the M-Scale beta weights in predicting GPA was found to be significant for Negro males and females at the .05 level. The SCAT-Verbal aptitude measure did not significantly increase the precision of estimating GPA for Negro males or females.

The factor analysis supported the hypothesis that there are elements of motivation that are common to Negro and Caucasian males. However, the elements did not have total overlap. The factors obtained from the 22 item factor analysis were: 1) chance taking versus no chance taking, 2) n-academic achievement, 3) intrinsicness versus extrinsicness, and 4) situational involvement. The factors obtained from the 45 item factor

analysis were: 1) short-term versus long-term involvement, 2) chance taking versus no chance taking, 3) unique versus common accomplishment, 4) materialism versus non-materialsm, and 5) academic interest versus non-academic interest.

CONCLUSIONS

On the basis of these findings, it is concluded that for the obtained sample:

1. Achievement differences exist between Negro and Caucasian eleventh grade students.
2. Except for the Negro male HTI sub-test the M-Scales correlate significantly with GPA (.26 to .36 for males, .34 to .64 for females).
3. The SCAT-Verbal does not significantly correlate with GPA for Negro males (-.01). The correlation between GPA and the SCAT-Verbal for females (.25) was significant at the .05 level.
4. As expected from the above findings, in the multi-correlations, the M-Scales account for most of the variance.
5. There are elements of achievement motivation that are common to Negro and Caucasian males. However, there were unique elements of motivation between the two groups that are worthy of further considerations.

DISCUSSION OF RESULTS

Because this study was of an exploratory nature, generalizations stemming from the results should be considered only with extreme caution until further research is conducted. However, the body of data prompts 1) a need for attempt at integration and 2) certain generalizations which are speculative in nature.

Mean GSCI Differences

Perhaps the most significant and surprising finding of this study was the fact that both Negro male and female students obtained higher mean scores on the GSCI than their Caucasian counterparts. "A high score on the GSCI indicates an individual who has a high need for academic achievement and would generally like the kind of tasks and activities that schools would value as part of the academic program."[3] A low score indicates individuals who choose activities that are not related to the school's program and do not result in academic rewards.

Adhering to the above interpretation of the GSCI, the Negro students in this sample demonstrated a significantly higher need for academic achievement than the Caucasian students. This finding is noteworthy

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[3]William W. Farquhar, Manual for Interpretation of the Michigan State M-Scales (Preliminary form).

in light of the extensive research of Rosen[4] who found that Negro students had the lowest mean motivation score (as determined by their responses to selected TAT cards) of the six ethnic groups involved in his study. Furthermore, a significant difference in achievement (GPA) between Negroes and Caucasians was found for both sexes with the Caucasian students obtaining higher mean achievement scores. If achievement motivation and actual achievement are conceptually and empirically related, there should be little difference between the two sets of scores. However, for the Negro students in the present sample, this was not the case. A discrepancy was obtained between their motivational scores and their school achievement.

One explanation hits at the heart of the present conception of the relationship between achievement motivation and actual achievement for Negro students. Perhaps Negro students are aware of the kinds of tasks and activities that are related to high achievement motivation. For example, when asking a Negro student whether he would rather have a "new car" today or a "college degree" tomorrow, he would select the "college degree" tomorrow. However, when this same student is placed in a competitive academic situation and has to mobilize himself internally in order to obtain the "college degree" (this involves long-term goal setting, unique accomplishment and competition with standards of excellence) he then selects the alternative. Now one may ask why does the student strive for non-academic goals when placed in an academic setting? One possible explanation might be the fact that the American Negro's history as a poor farm laborer or factory worker plus

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[4]Bernard C. Rosen, "Race, Ethnicity and Achievement," American Sociological Review, Vol. 24, No. 1, February 1959.

the sharp discrepancy between the professed American creed and his actual life experiences may work against striving for long-term goals of an academic nature. Rosen[5] points out that the Negro life situation does not encourage the belief that one can manipulate his environment or the conviction that one can improve his condition by hard work and long-term planning. In general, the life situation of many Negro youngsters may not foster the internalization of the actual achievement strivings of the dominant middle class Caucasian group.

Another factor that may be involved in the Negro students high mean motivation score is that of response "sets." In this case, "set" refers to the tendency of an individual to respond in such a manner as to give a "good" impression of himself.[6,7] The Negro students may be more attuned to "social desirability" or "acquiescent sets" because of the conforming life they have to lead.[8] The Negro child is often told to be on his best behavior because he will be evaluated more stringently than his Caucasian counterpart, and this may generalize to the testing situation.

One must recognize the possibility of having obtained an unusual sample of Negro students. Inspection of the distribution of the GSCI

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[5]Bernard C. Rosen, op. cit.

[6]A. L. Edwards,"The Relationship Between the Judged Desirability of a Trait and the Probability That It Will Be Endorsed." Journal of Applied Psychology, 1953, 37, pp. 90-93.

[7]C. Hanley, "Social Desirability and Responses to Items from Three MMPI Scales." Journal of Applied Psychology, 1957, 54, pp. 137-140.

[8]A. L. Edwards, op. cit.

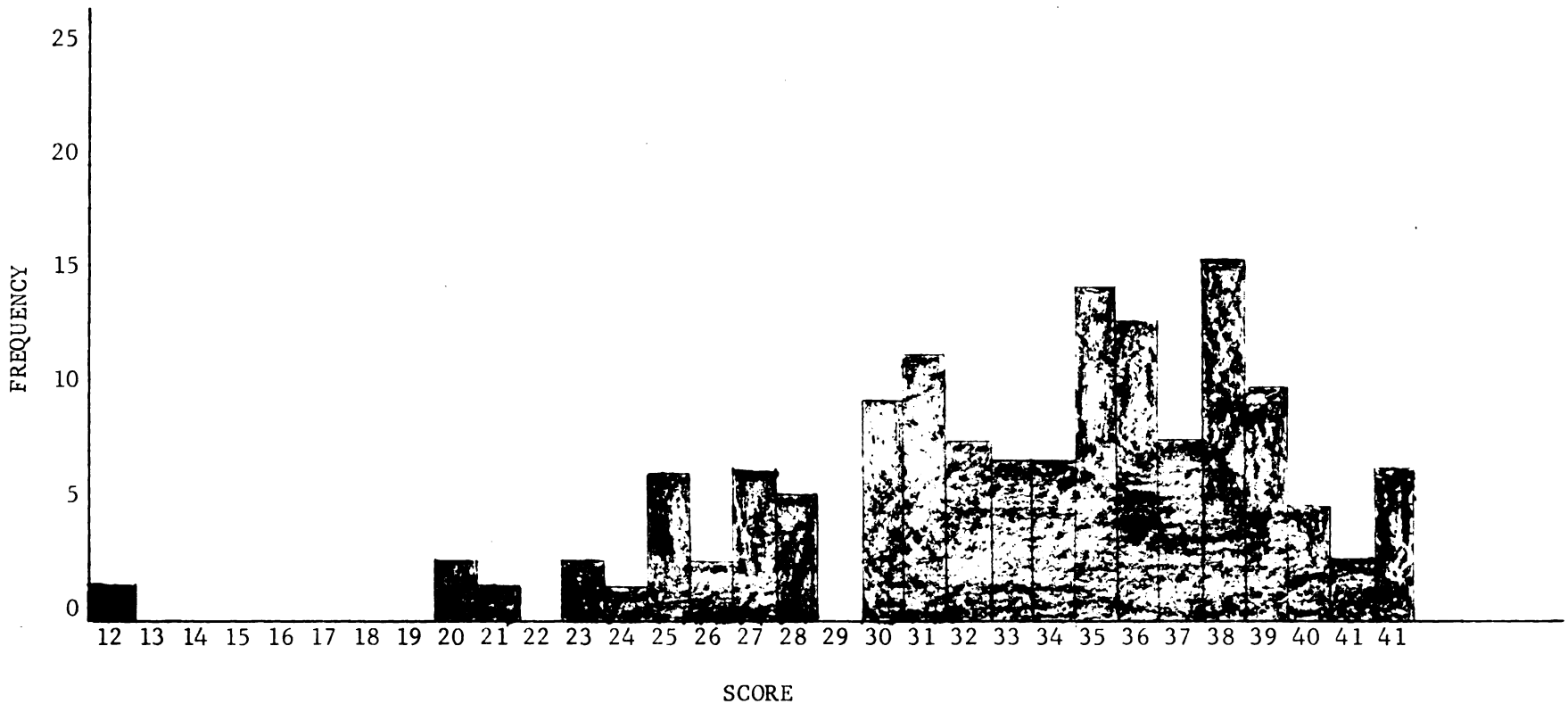
raw scores for Negro males (Figure 5.1) and Negro females (Figure 5.2) indicate that both distributions are asymmetrical, presenting a negatively skewed pattern. A larger sample of Negro students might present a different pattern of responses to the GSCI.

Considering the rather high Negro school drop out rate, it may be that the Negro students who remain in school beyond the eleventh grade may have identified with the values of the Caucasian group. This identification or conformity to the attitudes, values and goals of the school could well show up in responding to an objective measure of motivation. It is logical to assume that those Negro students who drop out of school are probably the poorer motivated ones which could account for the negative skewness of the GSCI distribution.

Aptitude and Motivation Prediction Differences

Another important finding is the fact that the SCAT-Verbal aptitude measure correlates low with achievement for Negro males (-.01) and females (.25). In the multi-correlations, the M-Scales account for most of the variance in estimating achievement. This finding has implications for school administrators and counselors, because scores on aptitude tests are often used in making student vocational decisions. As discussed in Chapter One, aptitude scores are quite often useful in predicting the academic achievement of Caucasian students. However, the finding that the SCAT-Verbal is a poor predictor of achievement for the Negro students of this sample should cause educators to critically examine the validity of the SCAT-Verbal and other aptitude measures in estimating achievement or making other vocational decisions concerning Negro students. Furthermore, the strength of the M-Scales in estimating achievement for this sample of Negro students emphasizes the relationship between non-intellectual factors and school performance. The latter finding warrants further research with this instrument and other non-intellectual measures in assessing achievement motivation.

FIGURE 5.1

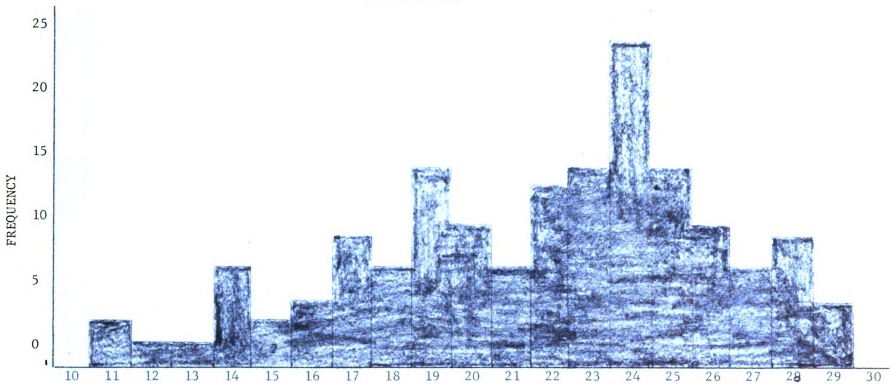


Distribution of GSCI Raw Scores for Negro Males

$\bar{X}$ = 33.48

SD = 5.67

FIGURE 5.2



Distribution of GSCI Raw Scores for Negro Females

$\overline{X}$ = 21.70

SD = 4.57

Reliability of HTI

Another finding that warrants discussion is the low reliability coefficient (.02) obtained on the Human Traits Inventory for Negro males. The mean, standard deviation and distribution of HTI scores for a sample of 50 Negro males are presented on Page 22, Chapter Three. A possible explanation of the restricted range of scores may be attributed to the test-taking attitude of some of the Negro students. It was noted that a number of Negro males were restless toward the end of the test (the HTI is the last sub-test in the battery), and they may have responded to the HTI without regard for the content of the items.

Another possible explanation of the low reliability estimate of the Negro male HTI sub-test concerns a socially desirable response set as previously discussed. The HTI contains personality items which attempt to assess the students fantasy life, level of anxiety, compulsivity and attitudes toward an academic setting. Again, it is possible that the Negro male is responding in a socially desirable manner. Cronbach[9] supports the view that social desirability and acquiescence affect test reliability. He states that where a response set such as gambling versus caution increases the spread of scores, reliability will tend to rise. Where a response set such as bias or alertness reduces the range of scores the reliability is expected to

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[9]Lee Cronbach, "Further Evidence on Response Sets and Test Design." Educational and Psychological Measurement, Vol. 37, pp. 90-93. 1950.

decline. For this set of data, it appears as though the latter is applicable. The implication of the HTI results obtained from this sample of Negro males is that further research with a different and larger sample of students is warranted.

Factor Analysis

The results of the factor analysis supported the hypothesis that there are elements of motivation that are common to Caucasian and Negro males. In the 22 item factor analysis on Caucasian and Negro males, the following common factors were derived on both groups: 1) chance taking versus no chance taking, 2) n-academic achievement, 3) intrinsicness versus extrinsicness, and 4) situational involvement.

On the chance taking versus no chance taking factor, the same two items (38 and 39) loaded highest on the first factor for both Negro and Caucasian males. These items suggest a concern with the amount of "risk" or "chance" a student is willing to take in order to achieve certain academic goals. The unique items stress, to a lesser degree, competition and academic involvement.

Factor II (n-academic achievement) seems to contain the greatest amount of common variance between the two groups. Four items (11, 18, 55 and 59) loaded highest on Factor II for both groups. Time involvement and accomplishment characterize these items. The unique elements appear to be concerned with materialism for Negro males and competition for Caucasian males.

Intrinsicness versus extrinsicness (Factor III) has two items (66 and 77) with similar loadings that are common for Negro and Caucasian

males. The latter two items concern material versus non-material goals. The unique items involve a "chance" factor for Negro males and academic interest factor for Caucasian males.

The remaining factor (situational involvement) has two items (9 and 49) in common for both groups. These items suggest a concern with the time and degree of academic involvement. The remaining items (for Caucasian males only) emphasize the element of competition.

On the basis of the two analyses, there are several common dimensions of motivation between Negro and Caucasian males. The chance taking, time, accomplishment and materialistic elements account for much of the common variance between the two groups. The competitive element for Caucasian males and the chance element for Negro males account for most of the uniqueness.

The implications of the factor analyses are that Negro students may have many of the same achievement motives as Caucasian students, although they achieve differently when placed in an academic setting. Perhaps the unique elements of competition for Caucasian students and the chance element for Negro students accounts for part of the variance. If the culture is so structured that the Negro has few chances of success, the Negro student may be reluctant (because of values, attitudes and training) to put himself in risk taking situations.

This study accentuates the need for extensive research in the area of Negro motivation and achievement. The fact that achievement differences were found between Negro and Caucasian students of both sexes supports the findings of previous research. The finding that Negro

students scored higher on an objective measure of academic motivation, and that aptitude measures may be poor predictors of achievement for Negro students, needs further assessment.

The M-Scales appears to be a crucial factor in the school achievement of Negro students, but at this time it is not clear what they are measuring on this particular sub-group.

RECOMMENDATIONS

1. The study should be replicated on another sample of Negro students to determine if the same motivational differences and similarities between Negro and Caucasian students will be obtained.
2. More items similar in content to the discriminating items of the M-Scales should be constructed in order to achieve a more reliable and valid measure of academic motivation.
3. All sub-tests of the M-Scales should be factor analyzed for Negro students in order to grasp a better conceptual understanding of the total test.
4. The relationship of teacher value acceptance to academic achievement and motivation should be assessed by correlating scores on a scale of teacher-values with GPA and motivation.
5. A longitudinal study for both Negro and Caucasian students to determine if the relationship between academic motivation and GPA remains constant.

6. This study should be replicated on Negro and Caucasian students in different settings, i.e., the eastern, borderline and southern areas of the United States.

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APPENDIX A

Unrotated Factors for Twenty-Two and Forty-Five Item Factor Analyses of the GSCI Based on Negro Males.

Item Number	Factors 1	2	3	4	Communality(h^2)
1	.10	-.04	-.17	.08	5
2	.39	.21	-.38	.03	39
3	.31	-.49	-.24	-.05	40
4	.35	.34	-.33	-.12	36
5	.15	.10	-.05	.29	12
6	.23	.19	.24	.18	18
7	.24	-.27	-.05	.02	13
8	.12	.13	.11	-.02	4
9	.45	.04	-.06	.15	23
10	.20	-.15	.17	.13	11
11	.21	.08	.32	-.13	17
12	.34	-.21	-.02	-.16	19
13	.49	.18	.17	-.02	30
14	.51	.17	.17	.32	42
15	.33	-.25	.07	.23	23
16	.28	.20	.35	-.09	25
17	.30	.31	-.22	.06	24
18	.29	.04	.05	-.10	10
19	.46	-.48	.10	-.12	47
20	.45	-.51	-.05	-.11	48
21	.39	.25	-.14	-.43	42
22	.45	.23	.07	-.03	26
Sum of Squares	2.56	1.48	.82	.61	

Item Number	Factors 1	2	3	4	5	Communality(h^2)
1	19	-04	13	-16	23	13
2	14	-12	-20	-26	-10	15
3	41	-01	-01	-44	08	37
4	33	-12	21	-33	05	28
5	40	-41	19	12	-11	39
6	29	37	-13	-31	-25	40
7	10	-03	-26	-13	19	13
8	41	15	-13	06	37	35
9	13	16	07	11	01	6
10	38	-33	-28	04	20	37
11	39	-16	-24	-17	-10	27
12	13	10	32	-14	-12	16
13	46	12	-08	-01	06	24
14	13	14	-05	11	14	7
15	37	-24	-02	-06	-03	20
16	40	-08	22	-25	-02	28
17	14	-20	-36	25	-10	26
18	38	00	26	04	-21	26
19	28	02	-36	06	08	22
20	17	18	10	31	01	17
21	26	-07	-08	-00	-12	9
22	38	-03	-09	22	08	21
23	17	-17	-09	-03	-13	8
24	52	30	-05	-22	-24	47
25	42	37	03	-13	-02	33
26	40	-02	05	13	21	22
27	27	35	20	07	04	24
28	21	11	-17	-18	22	17
29	08	06	-10	06	-01	2
30	50	-34	20	19	08	45
31	27	19	26	24	01	23
32	50	-43	-06	14	-02	46
33	38	-09	24	28	02	29
34	49	-33	12	06	-16	39
35	14	30	22	-03	15	18
36	39	17	-08	05	-20	23
37	-00	-05	-03	-08	-23	6
38	24	02	-16	-14	-04	10
39	01	05	07	15	27	20
40	40	-06	-14	-06	-14	21
41	-07	-12	13	-22	05	9
42	33	23	-10	27	12	26
43	20	17	-11	17	-09	12
44	43	32	10	02	30	39
45	14	35	-10	03	-03	15
Sum of Squares	4.56	2.00	1.33	1.41	1.02	

APPENDIX B

Sample Items from the
Michigan State M-Scales

Generalized Situational Choice Inventory

I would prefer to:

16. 1) Be successful in finishing a job, or
    2) Finish a job

17. 1) Play a game against experts and lose but learn how to play better, or
    2) Play a game against inexperienced players and win

18. 1) Get excellent grades because I have great ability, or
    2) Get average grades because I have average ability

19. 1) Be graded at the end of a course with the possibility of making an "A", or
    2) Get a "C" at the beginning of a course along with everyone else

20. 1) Make quick decisions and sometimes be right and sometimes wrong, or
    2) Deliberate over decisions and usually be right

Preferred Job Characteristics Scale

I would prefer:

86. 1) A job which absorbs my interests
    2) A job where I make few if any decisions

87. 1) A job where I could become known for outstanding accomplishments
    2) A job where I could not be fired

88. 1) A job which has high work standards
    2) A job which permits me to take days off when I want

89. 1) A job where I solve problems no one else can
    2) A job which does not require a college education

90. 1) A job which pays well and requires little effort
    2) A job where I could decide how the work is to be done

Word Rating List	Never	Sometimes	Usually	Always
Teachers feel that I am:				
129. patient	1	2	3	4
130. talented	1	2	3	4
131. dull	1	2	3	4
132. inefficient	1	2	3	4
133. practical	1	2	3	4

Human Trait Inventory	Never	Sometimes	Usually	Always
217. I have been quite independent and free from family rule	1	2	3	4
218. I have played that I am sick to get out of doing something	1	2	3	4
219. When I have an opinion, I stand up for it	1	2	3	4
220. It is difficult for me to keep interested in most of my school subjects	1	2	3	4
221. I have difficulty working under strict rules and regulations	1	2	3	4