

AN ASSESSMENT OF THE MOTIVATION FACTOR IN THE
ESTIMATION OF ACADEMIC ACHIEVEMENT OF ELEVENTH
GRADE INDIAN STUDENTS AND THE FACTORED
DIMENSIONS OF THE M-SCALES.
AN EXPLORATORY STUDY

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY

Van. C. Johnson
1963

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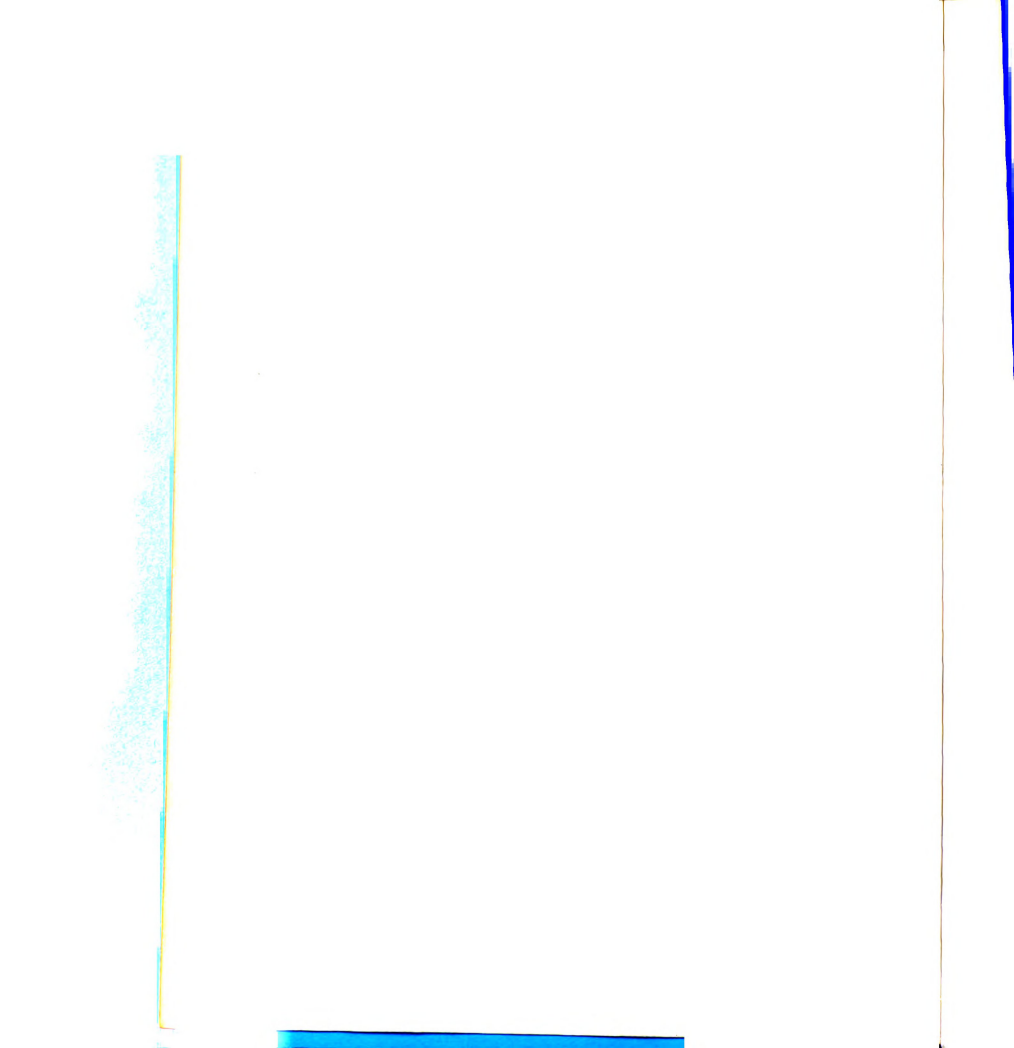
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ABSTRACT

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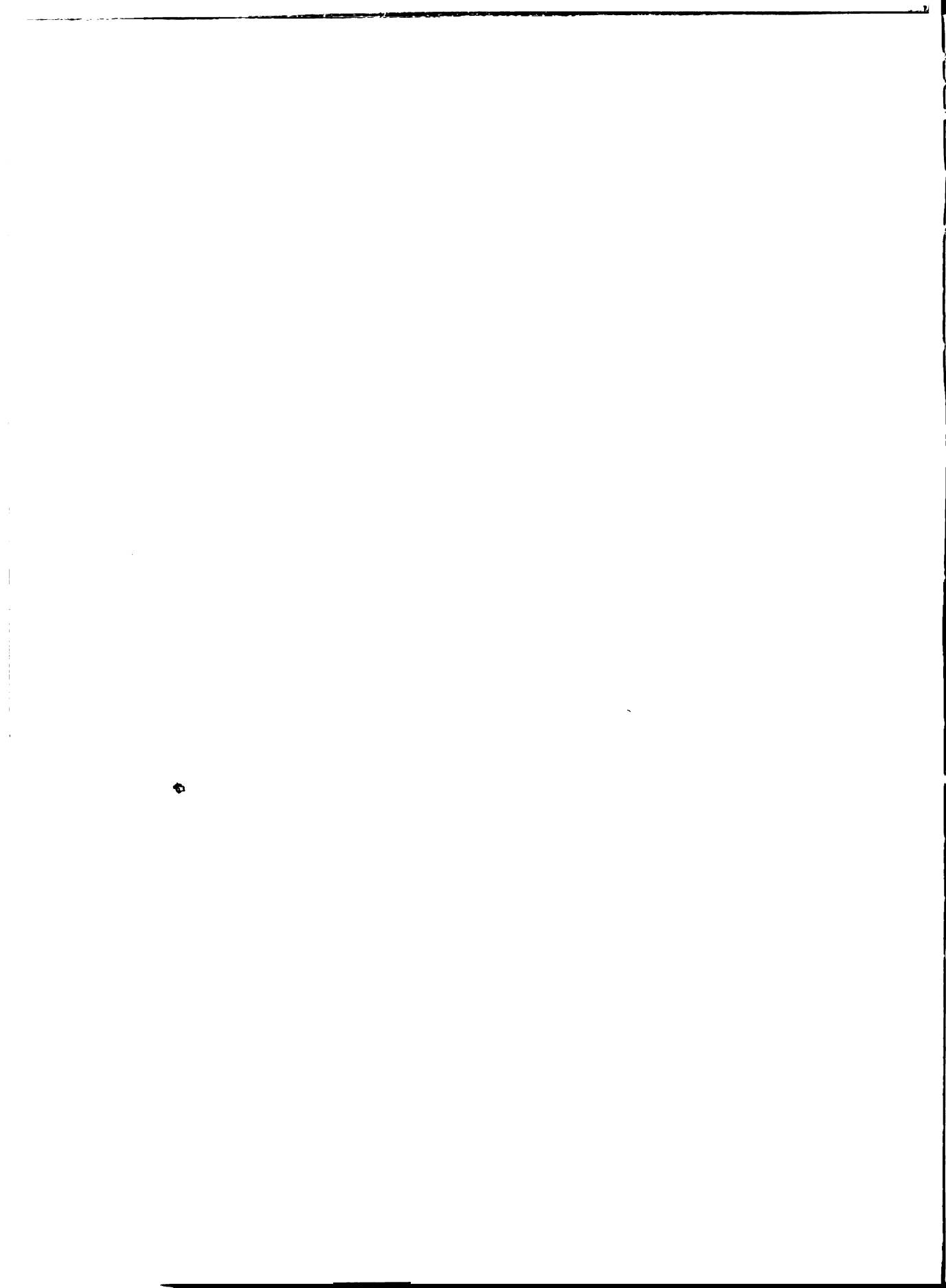
by Van C. Johnson

This study was concerned with 1) the assessment of an objective measure of motivation, the Michigan M-Scales, as a predictor of academic achievement for Indian male and female eleventh grade students, 2) a factor analysis of the GSCI, a sub-test of the M-Scales; the results to be compared, logically with a previous analysis based on a Caucasian eleventh grade sample.

An aptitude test score (DAT-VR), GPA, and scores on the four sub-tests of the M-Scales were obtained for each student; the mean scores for the male and female samples were compared with the mean scores computed from a study of Caucasian samples. A regression analysis was completed for both the male and female samples to estimate GPA when the four mean M-Scale scores were coupled with the mean aptitude test score. Responses to 22 selected items from the GSCI were factor analyzed with the principle axis solution; the quartimax method of rotation enabled an interpretation of the factors.

In this study, significant* differences were found in GPA and aptitude test scores; the Caucasian samples having the higher score in

* p. .05



each case. The Caucasian male sample recorded higher mean scores in the total score and all sub-tests of the M-Scales except in the GSCI; t-tests indicated significant differences in all but the PJCS mean scores. The Indian female sample recorded significantly higher mean scores in both the GSCI and the PJCS sub-tests; however, lower mean scores were gained in the other two sub-tests and the total M-Scales than were earned by their Caucasian counterparts.

The regression analysis indicated the precision of estimation of GPA was significantly improved when M-Scale scores were added to the aptitude score in both the male and female Indian samples. The t-test of significance from zero for both the aptitude and M-Scale beta weights in predicting GPA were significant at the .05 level for Indian males and females.

A factor analysis of the male responses to the GSCI sub-test indicated that although five factors were held in common by the Caucasian and Indian samples, there were also other factors unique to the Indian motivational pattern. The factors held in common were 1) chance taking versus no chance taking, 2) n-academic achievement, 3) intrinsicness versus extrinsicness, 4) speed versus thoroughness, and 5) situational involvement. Two factors unique to the Indian sample were 1) competitiveness versus non-competitiveness and 2) unique versus common accomplishment.

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BY
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A THESIS

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

DOCTOR OF PHILOSOPHY

College of Education

1963



926770
12/10/63

ACKNOWLEDGEMENTS

To Dr. Walter F. Johnson, my major advisor, friend, and chairman of my guidance committee.

To the other members of the guidance committee, Dr. William W. Farquhar, Dr. Bill L. Kell, and Dr. Fred. Vescolani.

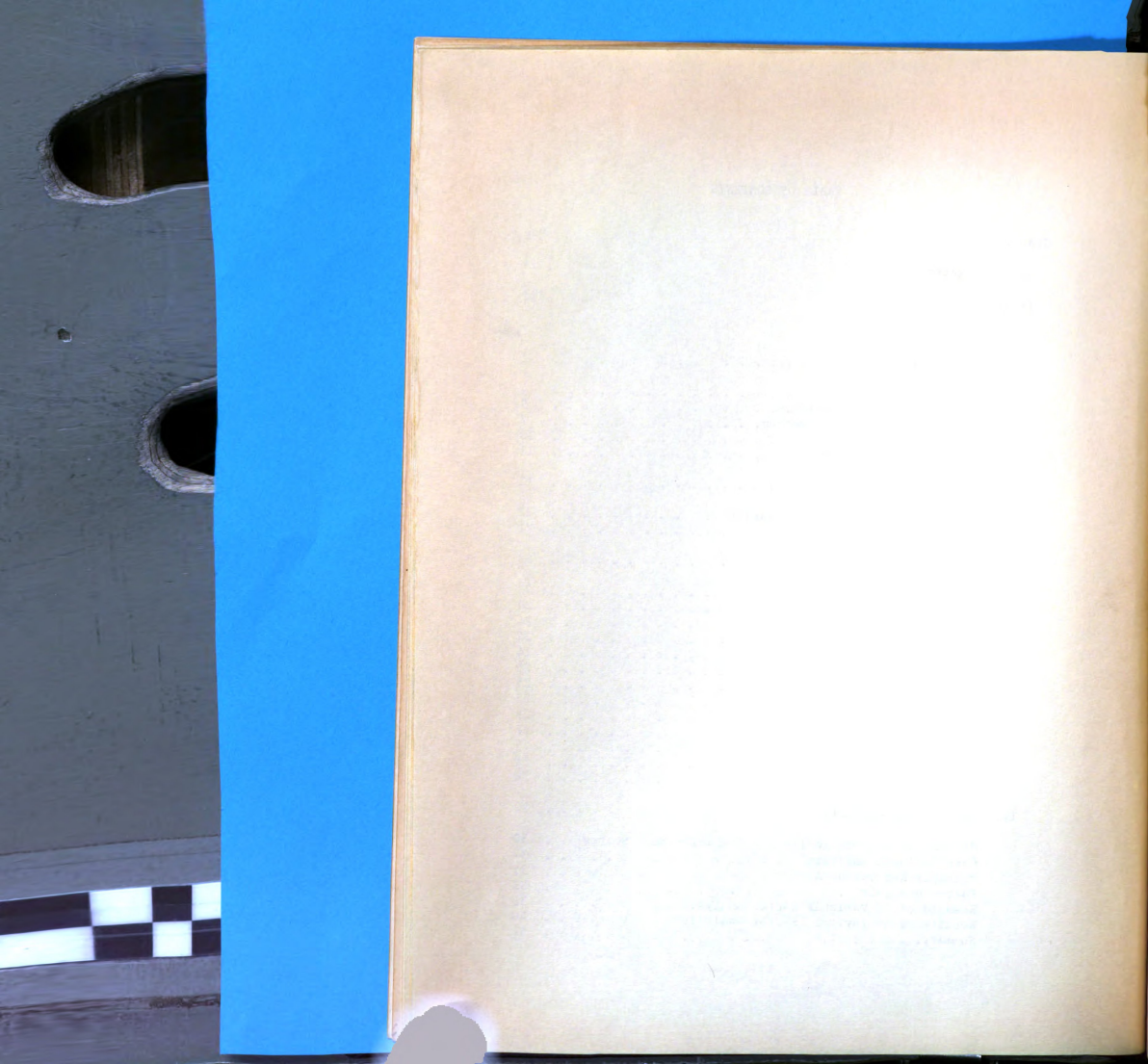
To Dr. Walter Stellwagon, Dr. Buford Stefflre, Dr. Robert L. Green and Miss M. Williams for technical and statistical assistance.

To Marilyn Webster for typing and editing the final draft.

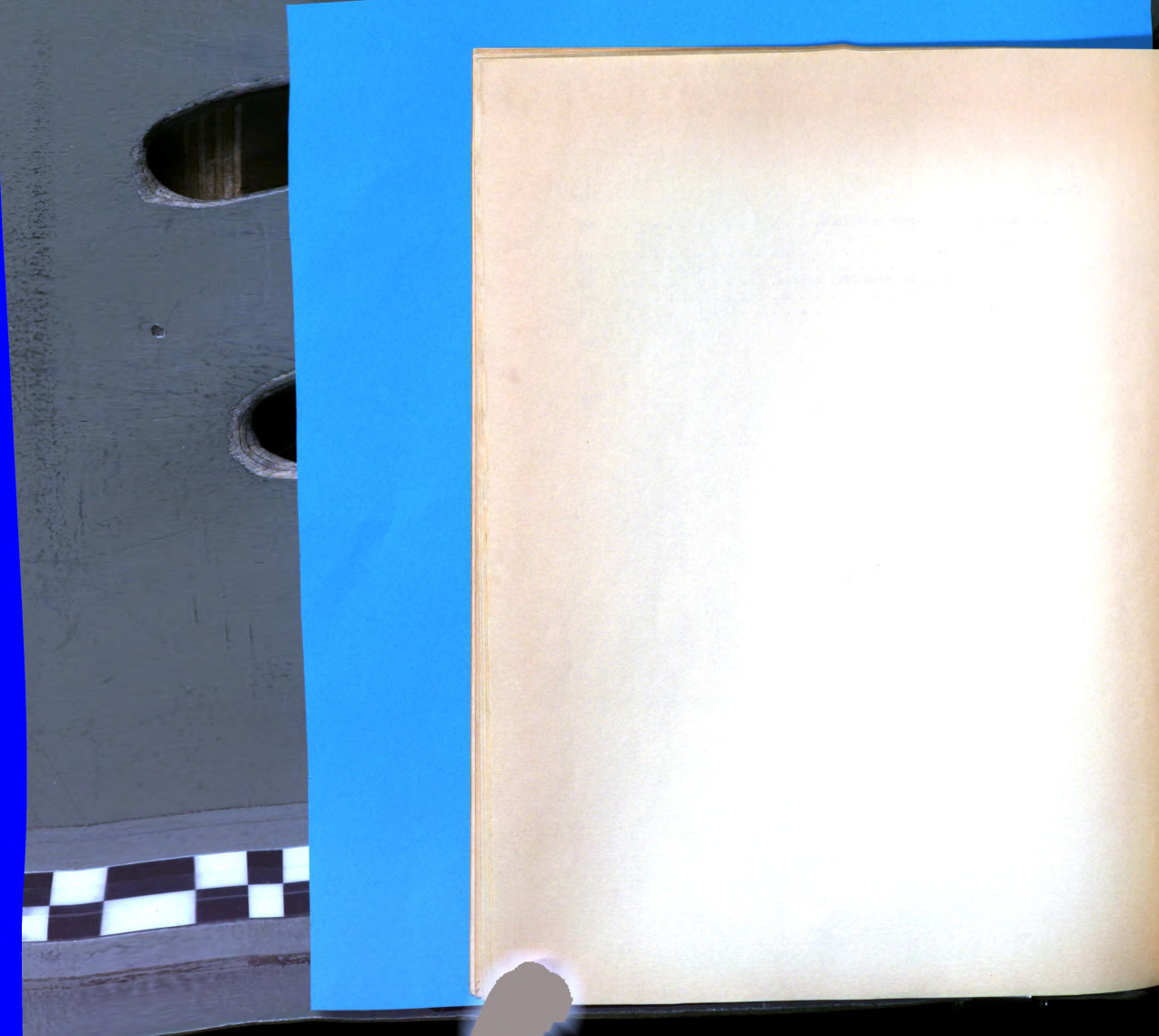


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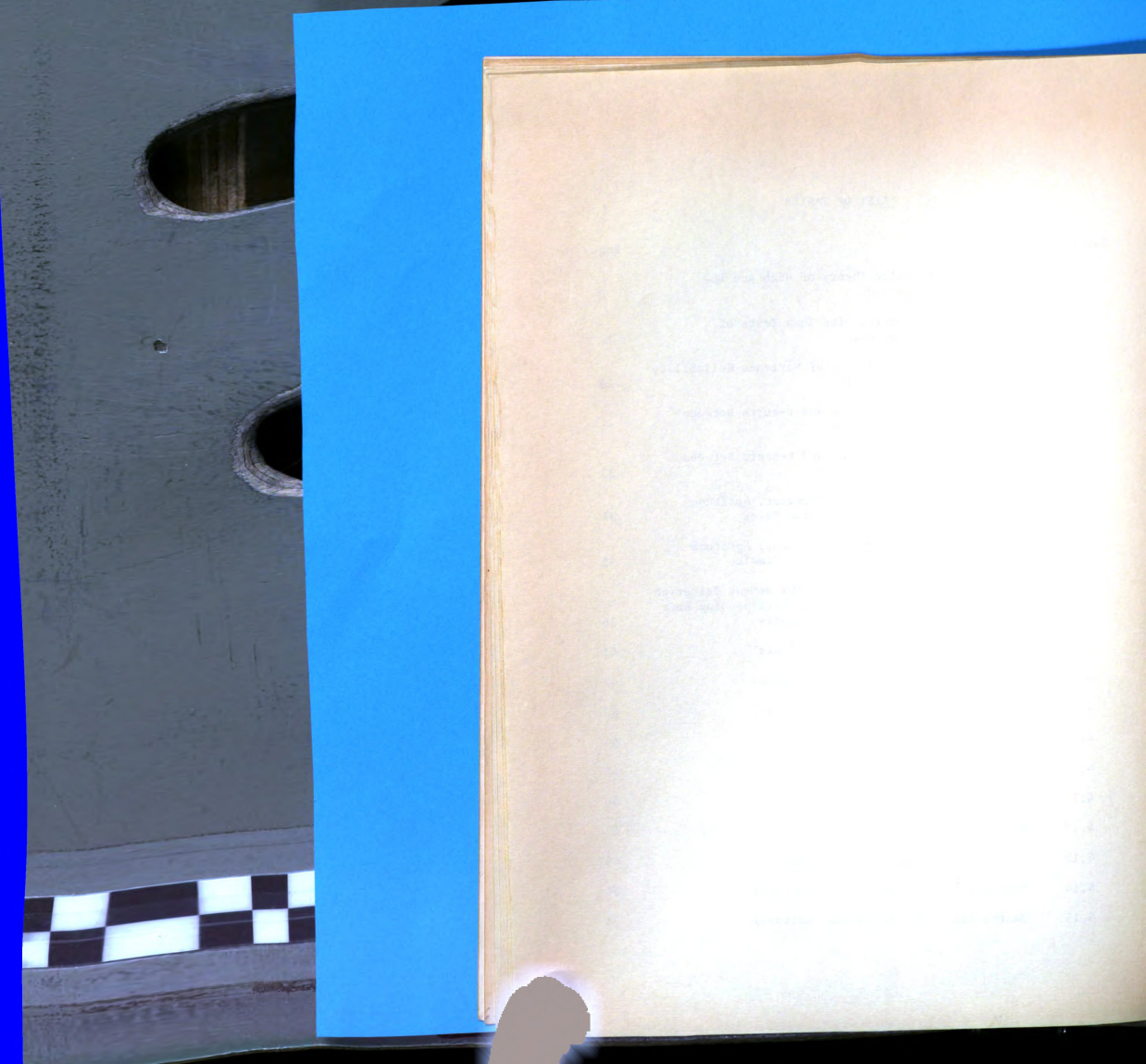
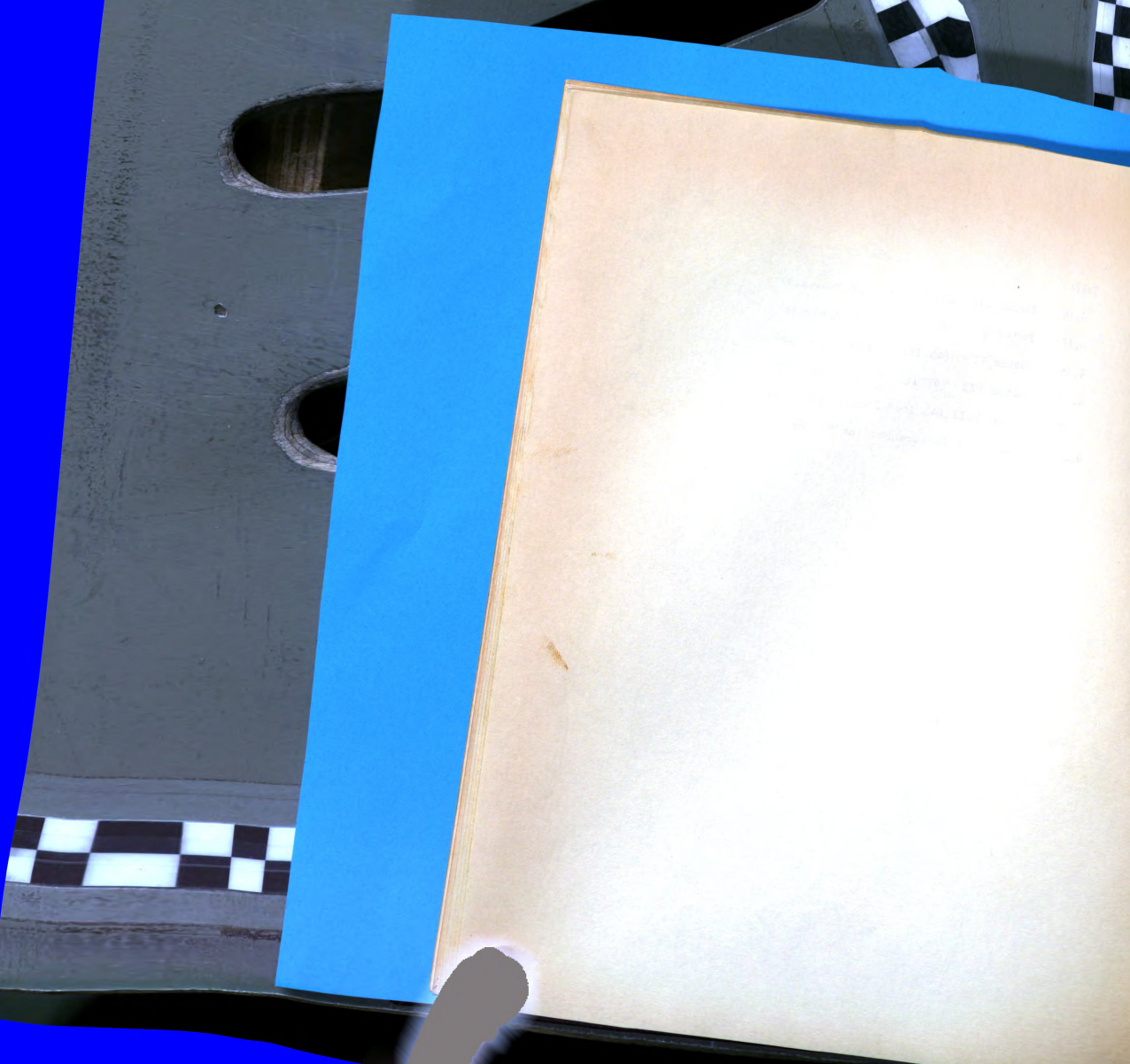


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CHAPTER I

THE PROBLEM

Educators have approached the problem of predicting academic success from many different positions, but always with a limited amount of success. Jacobs¹, Juola², and Holland³ have shown some positive relationship between academic aptitude and achievement. Garrett⁴ and Scabbell⁵ have attempted to predict achievement at the college level on the basis of elementary and secondary school grade point average, while Hansmeier⁶ has predicted college achievement on the basis of the Iowa Tests of Educational Development scores; this study yielded sub-test r 's ranging from .49 to .63.

¹James Jacobs, "Aptitude and Achievement Measures in Predicting High School Academic Success." Personnel and Guidance Journal, Vol. 38, 1959, pp. 334-341.

²Arvo Juola, "Predictive Validity of Five College Level Academic Aptitude Tests at One Institution." Personnel and Guidance Journal, Vol. 38, 1960, pp. 637-641.

³John L. Holland, "The Prediction of College Grades from the California Psychological Inventory and the Scholastic Aptitude Test." Journal of Educational Psychology, Vol. 50, pp. 500-503.

⁴Wiley Garrett, "Prediction of Success In A School of Nursing." Personnel and Guidance Journal, Vol. 38, 1960, pp. 500-503.

⁵Dale Scabbell, "Prediction of College Success from Elementary and Secondary Performance." Journal of Educational Psychology, Vol. 51, 1960, pp. 130-135.

⁶Thomas Hansmeier, "The Iowa Tests of Educational Development as Predictors of College Achievement." Educational and Psychological Measurement, Vol. 20, 1960, pp. 843-845.



Other researchers have emphasized the non-intellectual factors when predicting achievement. Hackett⁷ used 72 items from the MMPI in a test designed to predict academic success at the college level; he found a correlation of .72; however, his sample consisted of only 32 male students. Merrill⁸ and Middleton⁹ have used personality syndromes in their efforts to predict achievement. Chahbazi¹⁰ experienced some success when he used two projective tests in his prediction of academic success; in his initial test, he obtained an r of .76 with first-term grades; however, after the first term, correlations dropped considerably. Ahman¹¹ found the study habits inventory to be ineffective for the prediction of grades. McDavid¹² predicted achievement on the basis

⁷Herbert Hackett, "Use of MMPI Items to Predict College Achievement." Personnel and Guidance Journal, Vol. 39, 1960, pp. 215-217.

⁸Reed Merrill, "Personality Factors and Academic Achievement In College." Journal of Counseling Psychology, Vol. 6, 1959, pp. 207-210.

⁹George Middleton, "Personality Syndromes and Academic Achievement." Journal of Educational Psychology, Vol. 50, 1959, pp. 72-77.

¹⁰Parzi Chahbazi, "Use of Projective Tests in Predicting College Achievement." Educational and Psychological Measurement, Vol. 20, 1960, pp. 829-842.

¹¹Stanley Ahmann, "Predicting Academic Success in College by Means of a Study Habits and Attitude Inventory." Educational and Psychological Measurement, Vol. 18, 1958, pp. 853-857.

¹²John McDavid, "Some Relationships Between Social Reinforcement and Scholastic Achievement." Journal of Consulting Psychology, Vol. 23, 1959, pp. 151-154.



of social reinforcement with some success; McClelland¹³ found a relationship between achievement and the parental relationship with the student. Osborne¹⁴ attempted to predict academic achievement from a study of racial differences.

Regardless of the approach used in the efforts to predict academic achievement, Chahbazi¹⁵ and Farquhar¹⁶ found that if 50 per cent of the variance of the criterion scores was accounted for, the researcher was fortunate.

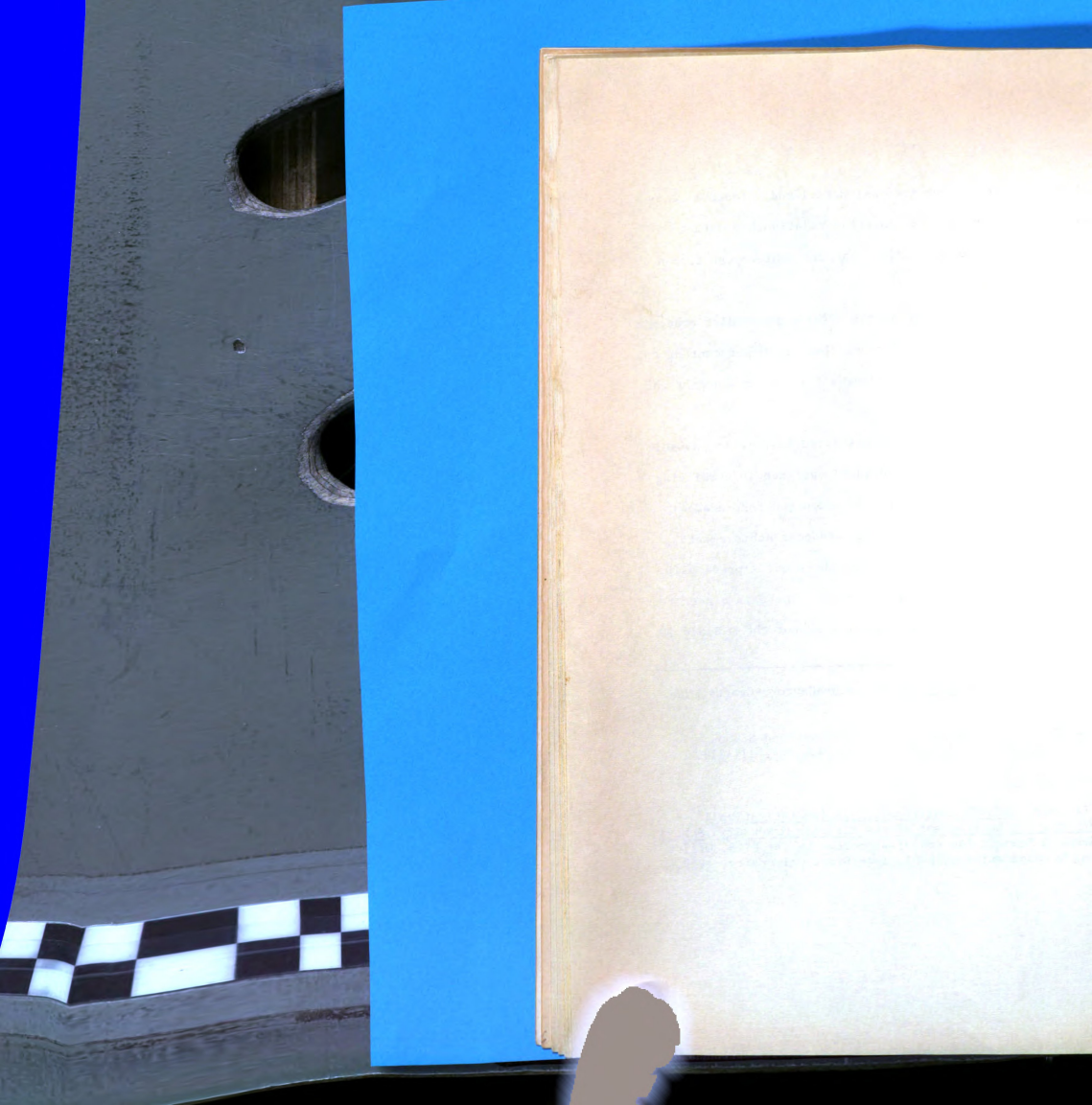
Farquhar and his associates have demonstrated that it is possible to account for a large segment of the residual variance in predicting achievement. It was demonstrated that, when accounted for, academic motivation increases precision in predicting academic achievement. However, the research of Farquhar, along with the studies previously mentioned, were restricted to Caucasian students. There is a need to study the minority groups, to ascertain whether or not the M-Scale is

¹³D. McClelland, Studies In Motivation, Appleton-Century-Crofts, New York, 1953.

¹⁴R. T. Osborne, "Racial Differences In Mental Growth and School Achievement." Psychological Report, Vol. 7, 1960, pp. 211-213.

¹⁵Parzi Chahbazi, op. cit.

¹⁶William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying the Achievement of the Eleventh Grade High School Students, Research Project 846 (8453) supported by the U. S. Office of Education, in cooperation with Michigan State University, 1959.



applicable to their population and also to evaluate the factors that do seem to be a part of their motivational pattern.

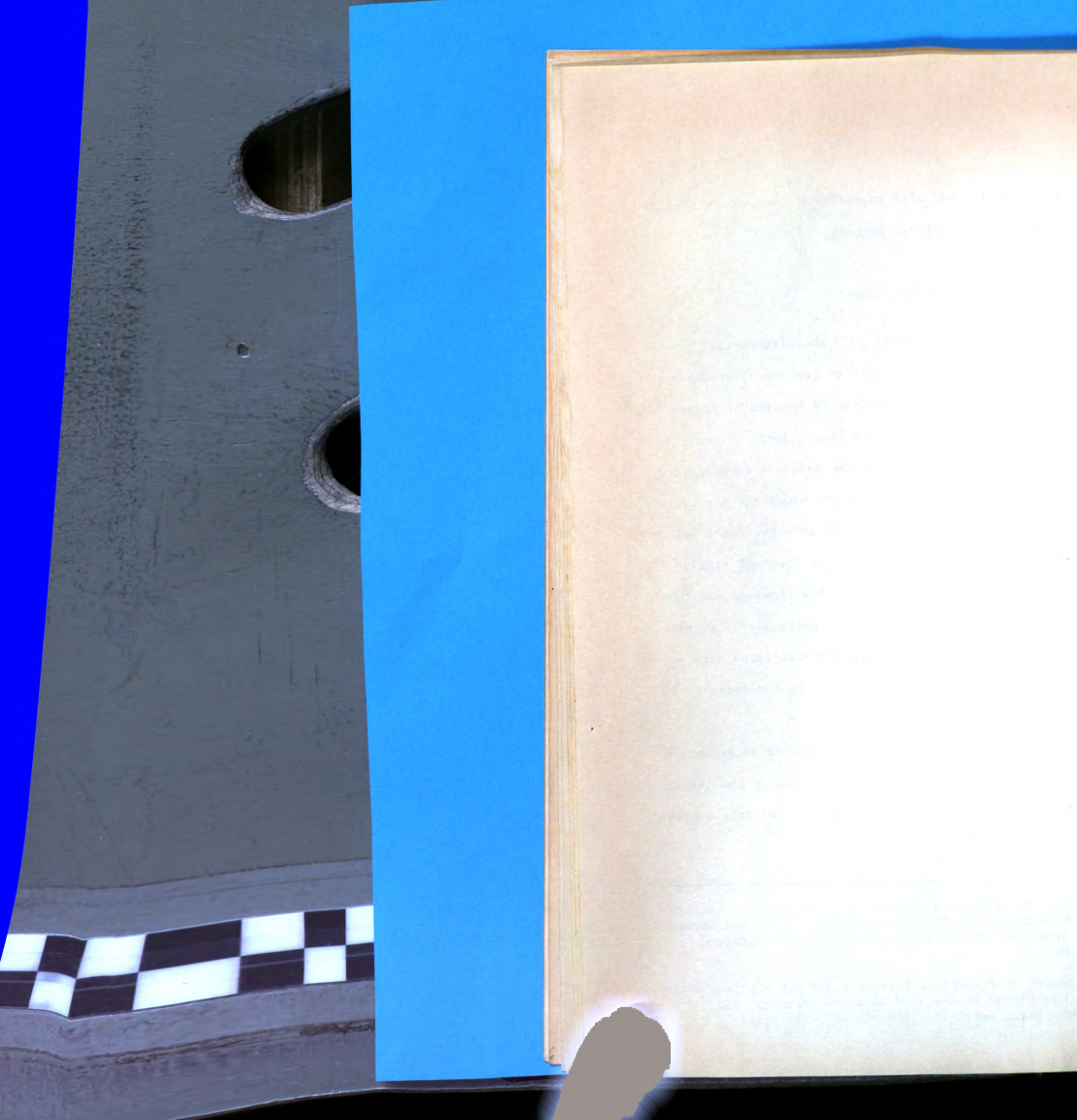
PURPOSE OF THE STUDY

The purpose of the study is to investigate the differential predictions and factored dimensions of an objective measure of academic motivation, the Michigan M-Scales, when applied to samples of Indian and Caucasian male and female high school students. There not only is a need to study the predictive efficiency of the M-Scales when applied to an Indian minority, but there is also a need to study the structure of whatever motivation does exist. One method of interpreting a set of data is through factor analysis; by this method the items of similar content may be grouped to give interpretation to the findings and thus confirm or reject the theory. Factor analysis is particularly germane to a study of this nature because Farquhar and his associates have completed such an analysis of all the M-Scales for the Caucasian group.¹⁷

Multiple regression analysis has also been conducted on Caucasian males and females; this same analysis has been conducted on the Indian sample in the present study to provide a comparison of multiple regression correlation coefficients.¹⁸

¹⁷ 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.

¹⁸ 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.



IMPORTANCE OF THE PROBLEM

In a study of the Indian race in contemporary United States, Evans¹⁹ estimated that their population was equivalent to that of Montana. He indicated further that the Navajos, a nation of 29,000 in 1919, has 79,000 today and a projected population of 350,000 in thirty-five years, are symbolic of what is happening to the Indian population. Thompson²⁰ has estimated the average educational background of the typical American to be about 10 years while the Indian's is presently less than one year. If education is a requisite for future employment, he states that 50 per cent of the Indian labor market will be unemployed in 1970.

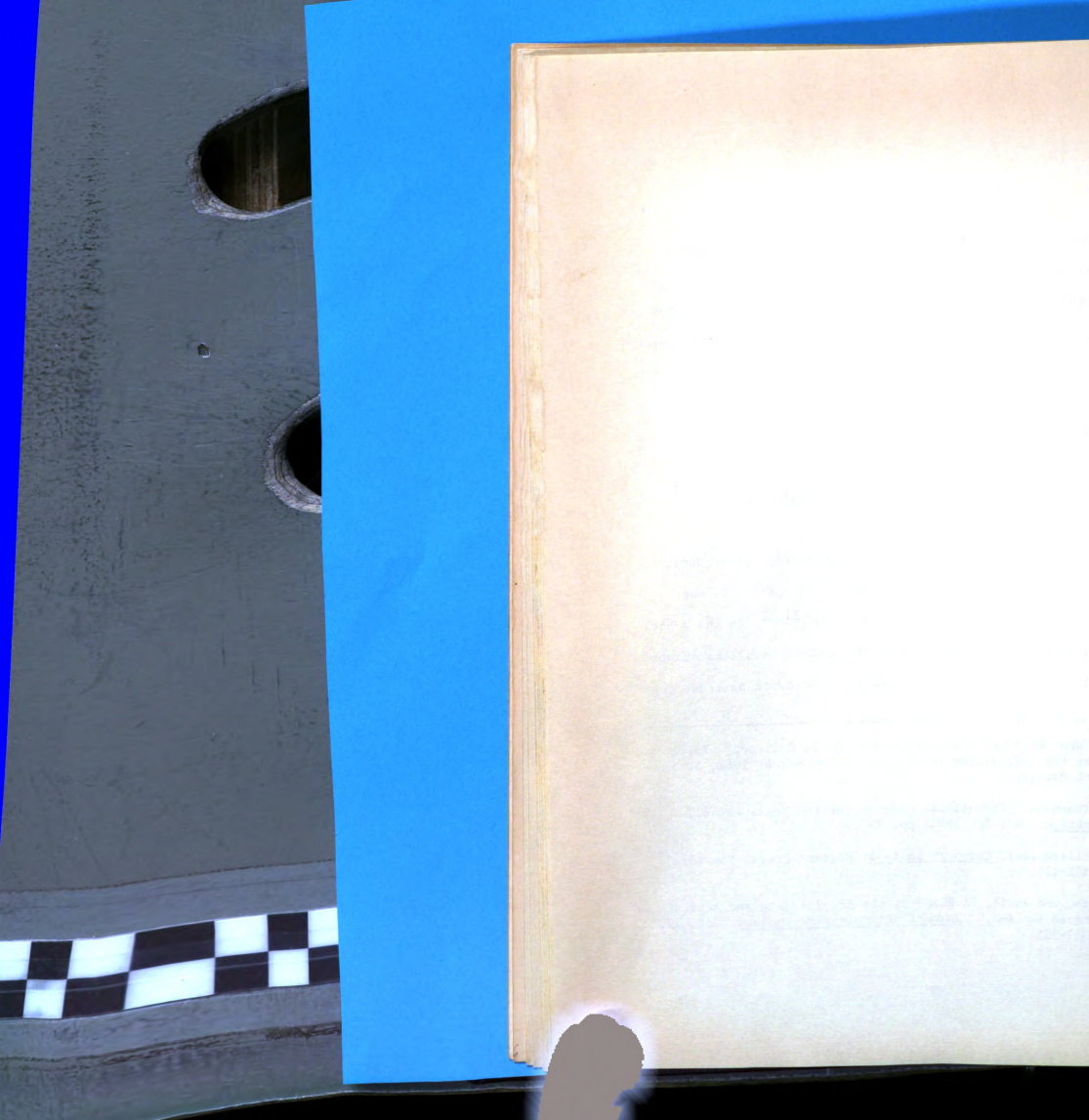
Studies indicate that the Indian fails to achieve in academic subjects as well as his Caucasian counterpart and that it is more probable that he will not complete his education.^{21,22} In the school year 1958-59, 60 per cent of the Indian high school enrollees dropped out of school. The Indian has often had lower academic aptitude test

¹⁹W. Evans, "What We Need To Know Before We Go To College." Paper delivered at the 1962 Indian Youth Conference, March, 1962, Springfield, South Dakota.

²⁰Hildegard Thompson, "Educational Demands for the Years Ahead." Indian Education, Vol. 24, 1961, pp. 1-3.

²¹Sister Carolissa Levi, Chippewa Indians, Pageant Press, New York, 1959, pp. 112-116.

²²Garth, Smith, and Abell, "A Study of the Intelligence and Achievement of Full Blooded Indians." Journal of Applied Psychology, Vol. 12, 1944, pp. 342-351.



scores.^{23,24} Educators have sought to answer the problem of low achievement on the basis of intellectual deficiency of the race; however, as the Indian has become more acculturated, this argument has become less conclusive.²⁵ Havighurst²⁶ explored the ability of the Sioux Indian to achieve in school and concluded that factors other than the intellectual one must be considered if the Indians' achievement problem is to be resolved. There are few Indian studies endeavoring to relate success in school to factors other than academic aptitude.

Coombs²⁷ studied the academic achievement of the Indian as it relates to the area of the nation in which he lives, the degree of Indian blood and pre-school language spoken, the age of students in relation to grade, the choice of friends, regularity of school attendance, and the educational aspiration of the student. He concluded that there are factors other than IQ contributing to the lack of academic achievement by the Indian student. Farquhar's²⁸ comprehensive study of

²³B. L. Crump, "The Educability of Indian Children In Reservation Schools." Published Doctoral Dissertation, Columbia University, 1932.

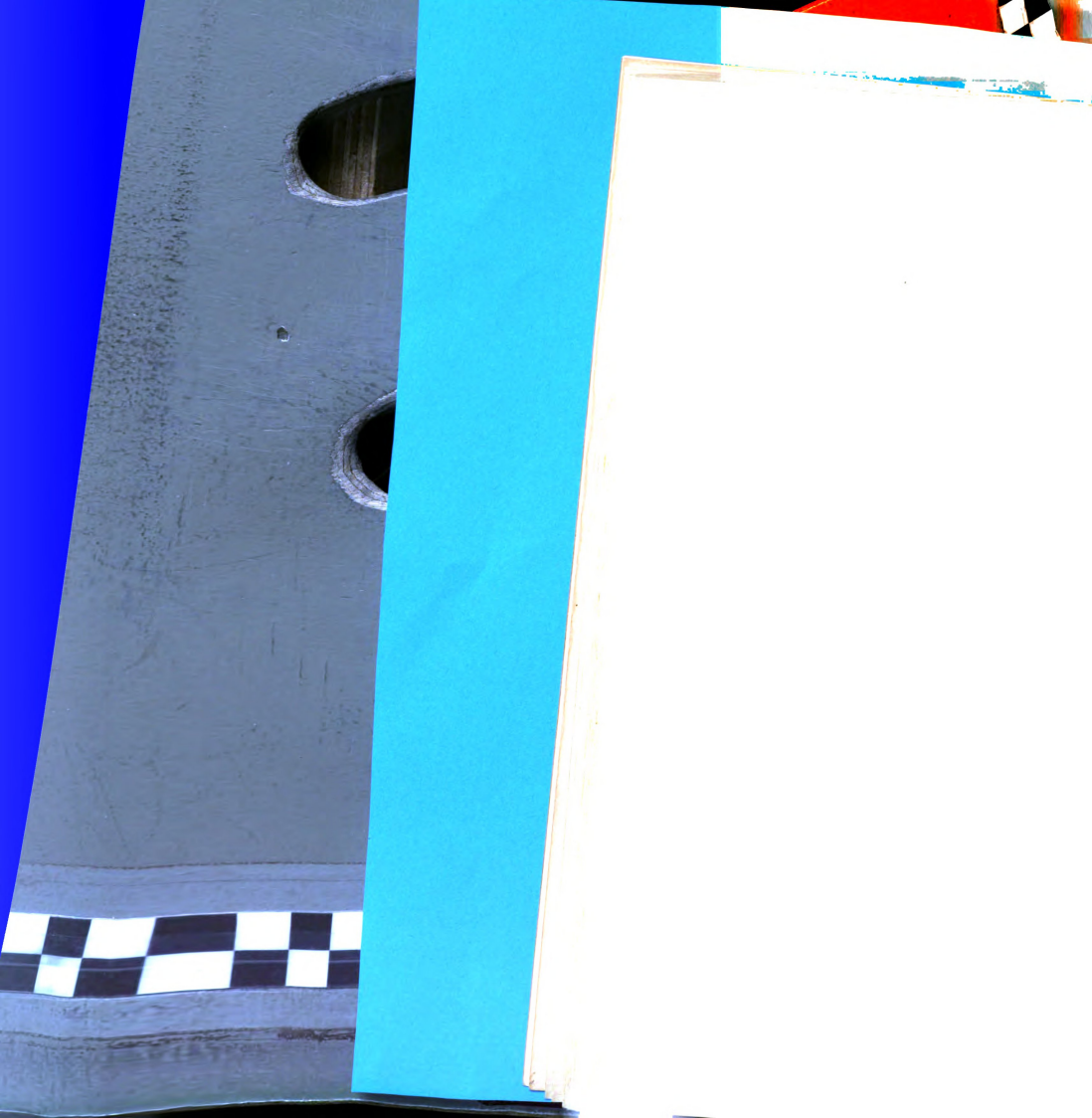
²⁴William T. Hagen, American Indians, University of Chicago Press, Chicago, Illinois, 1961, pp. 151-171.

²⁵Gordon MacGregor, Warriors Without Weapons. University of Chicago Press, Chicago, Illinois, 1946.

²⁶Robert J. Havighurst, "Education Among the American Indians." Journal of the American Academy of Political and Social Science, Vol. 311, May, 1957, pp. 105-115.

²⁷L. M. Coombs, The Indian Child Goes To School, Haskell Press, Haskell, Kansas, 1958.

²⁸William 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.



Caucasian eleventh grade students revealed that self-concept, need for academic achievement, occupational aspirations and certain personality factors were related to school achievement. This study was conducted in an effort to provide additional knowledge relative to the lack of achievement by a growing Indian student population. There are now 113,000 Indian students in school, and the number is increasing by three per cent per year.²⁹ It becomes increasingly important to understand better the unique nature of Indian achievement and motivation.

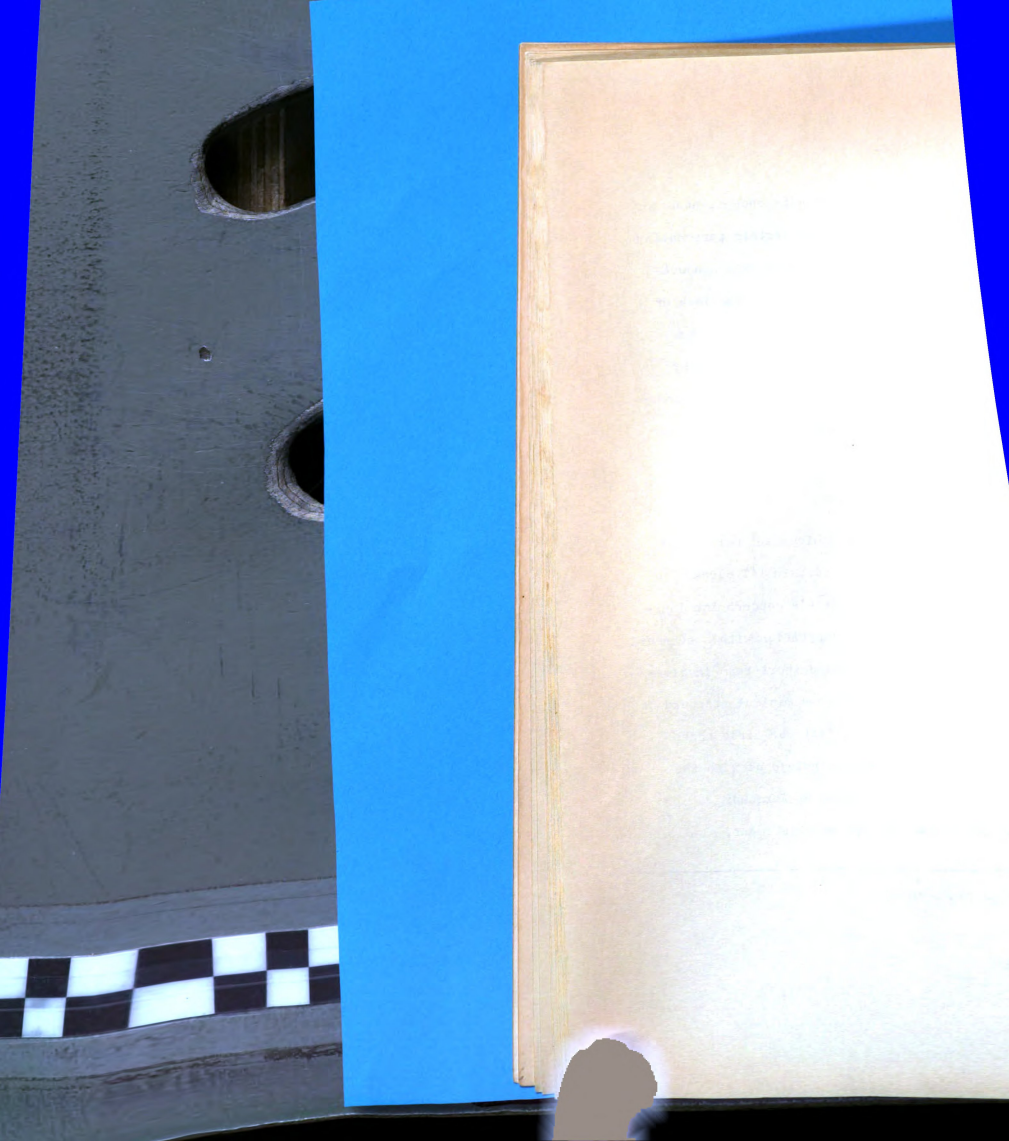
THEORY

McClelland³⁰ theorized that the need for achievement motivation may be indicated by the subject's responses to certain TAT cards. Interpretation is made on the basis of the subject's concern for long-term involvement, unique accomplishment, and competition with a standard of excellence. To the above, Farquhar³¹ has added short-term involvement, common accomplishment, and competition with a minimal standard of excellence factors. Farquhar's theory assumes that the first three factors provided by McClelland characterize the individual with the high n-achievement, while the three factors added by Farquhar characterize the student who possesses the low n-achievement.

²⁹Hildegard Thompson, op. cit., pp. 4-6.

³⁰D. McClelland, op. cit.

³¹Willaim W. Farquhar, op. cit.



A summary of the polar theoretical dimensions of 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 minimum standard of excellence

From this theory, Farquhar and associates developed the M-Scales, an objective measure of academic motivation which increases precision in predicting high school grade point average. The M-Scale is comprised of four sub-tests: 1) Generalized Situational Choice Inventory; this sub-test measures the student's need for academic achievement. 2) The Word Rating List which measures the student's perception of himself in an academic setting. 3) The Preferred Job Characteristics Scale, a measure of the occupational aspirations of the subject. Pelleteira's³² study indicated that, due to limited economic opportunities and the mores of the Indian, the occupational aspirations are limited. 4) The

³²A. J. Pelleteira, "Counseling Indian Youth." Occupations, 1941, pp. 19-23.



Human Trait Inventory measures unique characteristics of low and high motivation students in an academic situation.

The research of Payne³³, Taylor³⁴, and Green³⁵ have shown empirically that the above factors are related to school achievement.

The review of the literature indicates lower school achievement from the Indian student than his Caucasian counterpart; it may be assumed that a part of this variance may be accounted for by lower motivational levels of the Indian.

An attempt is made in this study not only to study the differential predictiveness of the M-Scales, but to examine the assumption that the Indian's cultural environment causes him to respond differently to a scale of academic motivation than his Caucasian counterparts. Finally, the results of this study have been compared with the results of a similar study involving Caucasian students.³⁶

³³David A. Payne, "The Concurrent and Predictive Validity of an Objective Measure of Academic Self-Concept." Educational and Psychological Measurement, in press, 1962.

³⁴R. G. Taylor, "Personality Factors Associated with Eleventh Grade Male and Female Discrepant Achievers." Unpublished Doctoral Dissertation, Michigan State University, 1962.

³⁵Robert Lee Green, "The Predictive Efficiency and Factored Dimensions of the Michigan M-Scales for Eleventh Grade Negro Students, An Exploratory Study." Unpublished Doctoral Dissertation, Michigan State University, 1962.

³⁶William W. Farquhar, "The Predictive Efficiency of the Michigan M-Scales." Paper delivered at the 1962 American Personnel and Guidance Association Meeting, April 18, 1962, Chicago, Illinois.



THE HYPOTHESES

The hypotheses to be tested in this study are:

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

The following hypothesis will be tested because research has indicated lower achievement³⁷ from the Indian student than from his Caucasian counterpart.

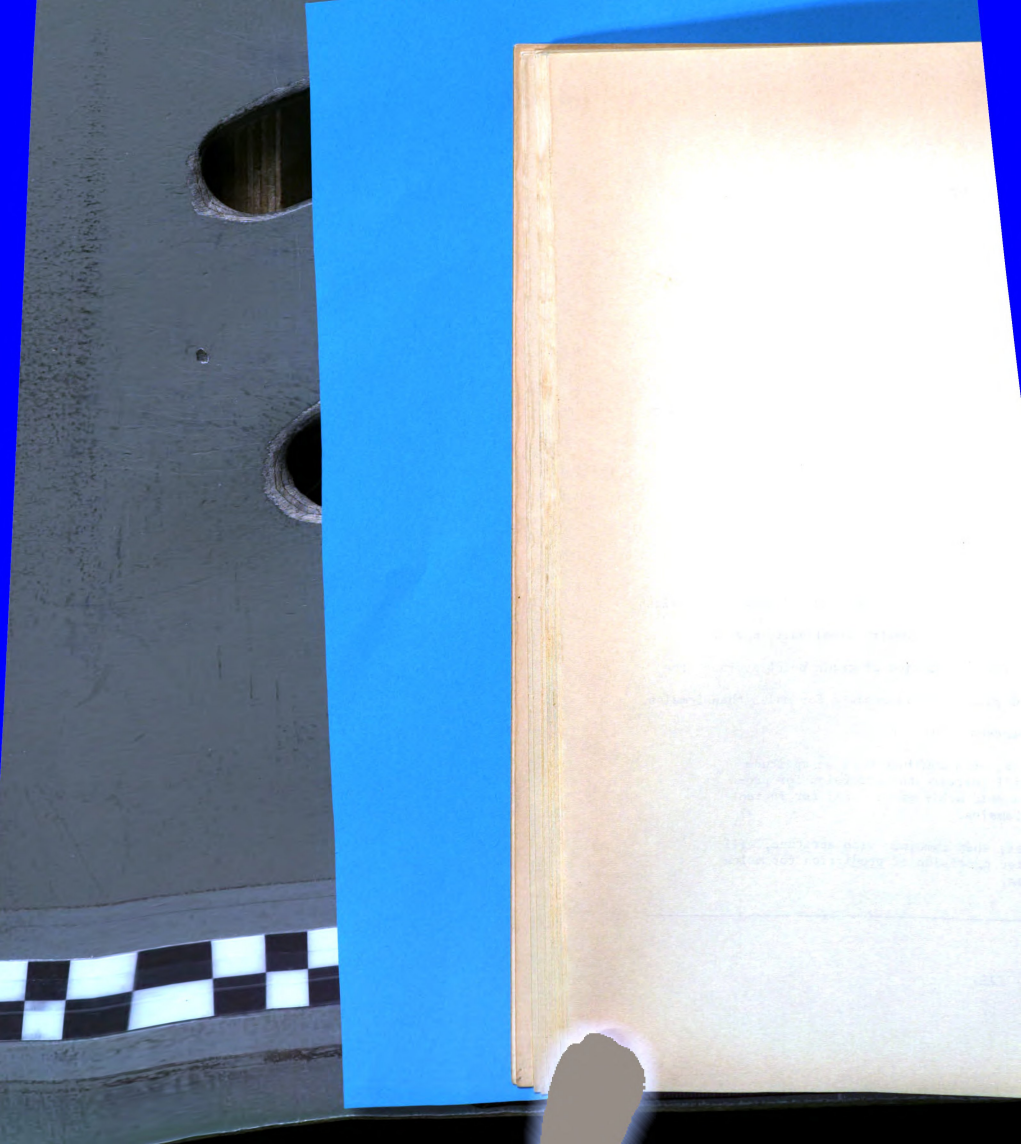
3. There is a significant difference in mean grade point average between Indian and Caucasian males and females.

Research by Farquhar and his associates, when testing the predictive efficiency of the M-Scales, indicated the following conclusions for Caucasian males and females: A construct-validated measure of academic motivation increases prediction of grade point average; the validity and precision of prediction is greater for males than females.³⁸ Thus, the following hypotheses will be tested:

4. The M-Scales, when combined with an aptitude measure, will increase the precision for predicting academic achievement (GPA) for Indian males and females.
5. The M-Scales, when combined with aptitude, will yield greater precision of prediction for males than females.

³⁷L. M. Coombs, op. cit.

³⁸William W. Farquhar, op. cit.

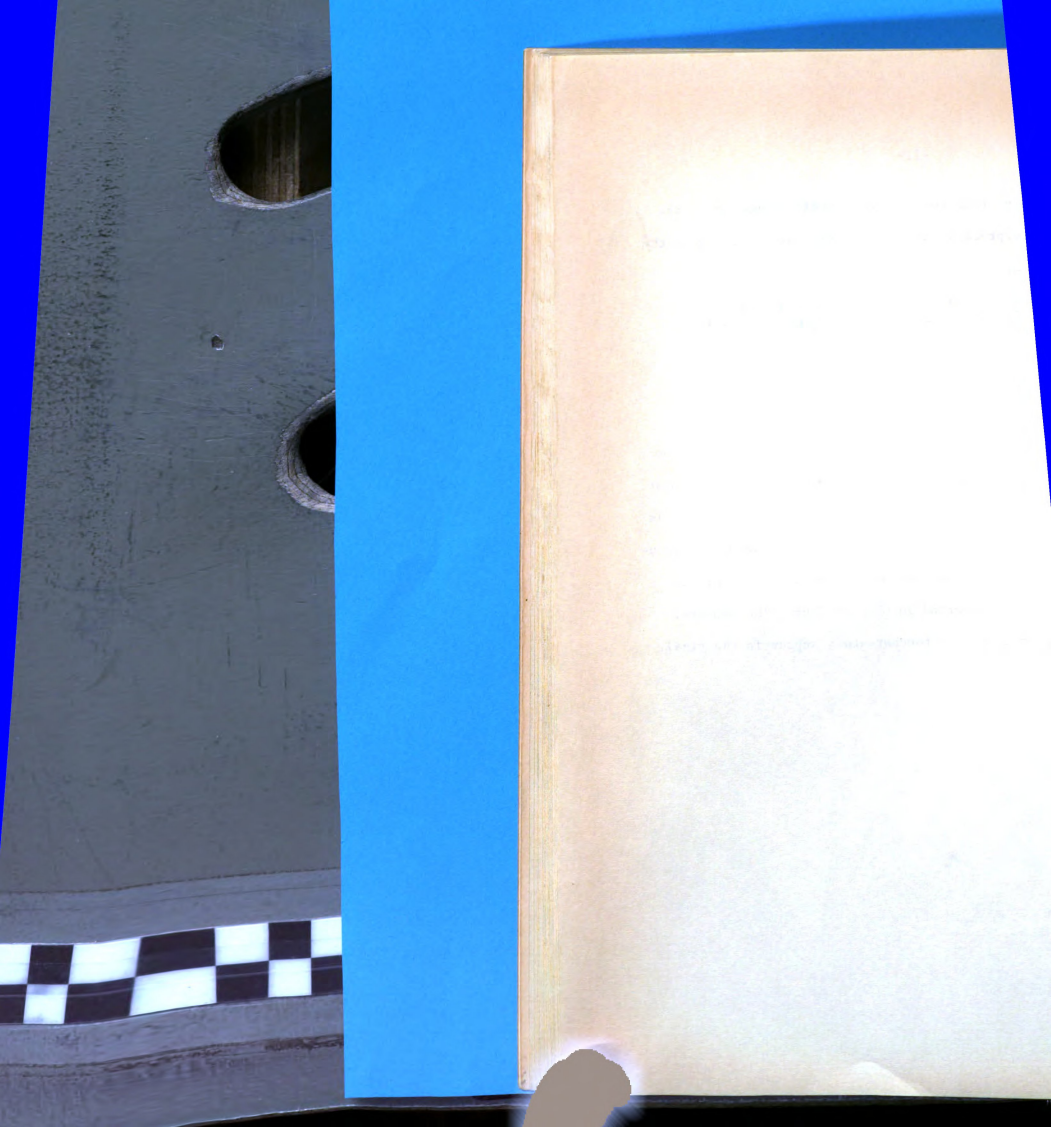


A factor analysis of both the male and female responses to the GSCI will yield an interpretable set of factors; the following is the hypothesis to be tested.

6. For the male responses, the factor analysis will yield a factorial structure different in nature from that found for the Caucasians.

ORGANIZATION OF THE STUDY

The general plan of the study is to present, in Chapter Two, the review of literature which shows the relationship between achievement, aptitude and motivation for the Indian student. The third chapter is an account of the methodology used in collecting, organizing and tabulating the data and the techniques employed in analyzing them. The results of the analysis is reported in Chapter Four. The summary, conclusions, and implications for further study appear in the final chapter.



CHAPTER II

REVIEW OF LITERATURE ON APTITUDE, ACHIEVEMENT, AND MOTIVATION OF THE AMERICAN INDIAN

A review of literature reveals few studies of the Indian student's achievement in school as it is related to academic ability and motivation. The I. Q.'s and achievement scores of the Indian and Caucasian students have been compared and some of the discrepant observations have prompted speculation from educators.

One of the first efforts to explain low achievement of the Indian student on the basis of deficient mental ability was made by E. C. Rowe¹ in an Indian school at Mount Pleasant, Michigan. This first testing made use of a revision of the Binet tests, known as the Binet-Simon Scale of Intelligence. Five hundred and forty-seven whites were tested for comparison with two hundred and sixty-eight Indians in grades kindergarten through eight. Because the term I. Q. was not yet in general use, in 1914, Rowe reported his results in terms of relative mental age. He summarized his report with three conclusions:

1. The Indians are everywhere inferior to the whites.
2. Indians are weaker in tests involving comprehension and definition than in tests of a more purely perceptual or memory nature.
3. Indian children average much older than the white children with whom they are compared.

¹E. C. Rowe, "Five Hundred Forty Seven White and Two Hundred Sixty Eight Indian Children Tested by the Binet-Simon Tests." Journal of Social Psychology, 1928, pp. 452-469.



Krush, Lello, and Warner² report a study made in conjunction with the state wide testing program of the South Dakota Department of Public Instruction. Between the years 1959 and 1961, five separate classes at the Flandreau Indian School and their Caucasian counterparts at the Flandreau Public High School were concurrently administered the Iowa Test of Educational Development. This test is designed to measure educational growth in nine separate areas concentrating on broad intellectual skills, on the student's ability to understand and use them rather than on sheer memory. The results of the study are presented in Table 2.1. The reasons for the variations in the scores of the students from the two schools, within the same community, are complex, but they could include cultural factors, familiarity with tests of this kind, and motivation. The authors conclude that a comparison of the test results indicate that the Indian has a wide gap to close.

In the same study, the California Test of Mental Maturity, Short Form, Advanced Level, was administered in an effort to assess the ability of the Indian student to achieve. The range in mental age for the males was 158 to 213 months and, for the females, 151 to 206 months; the mean mental age was 180 months. The chronological age for the same sample ranged from 167 to 221 months for the boys and from 157 to 228 months for the girls; the mean chronological age was 187 months. The mean I. Q. was 96.

²T. P. Krush, A. J. Lello, and B. B. Warner, "Fourth and Fifth Annual Reports of the Mental Health Clinic at the Flandreau Indian School." Mimeographed report presented at the Flandreau Indian School, Flandreau, South Dakota, 1961.

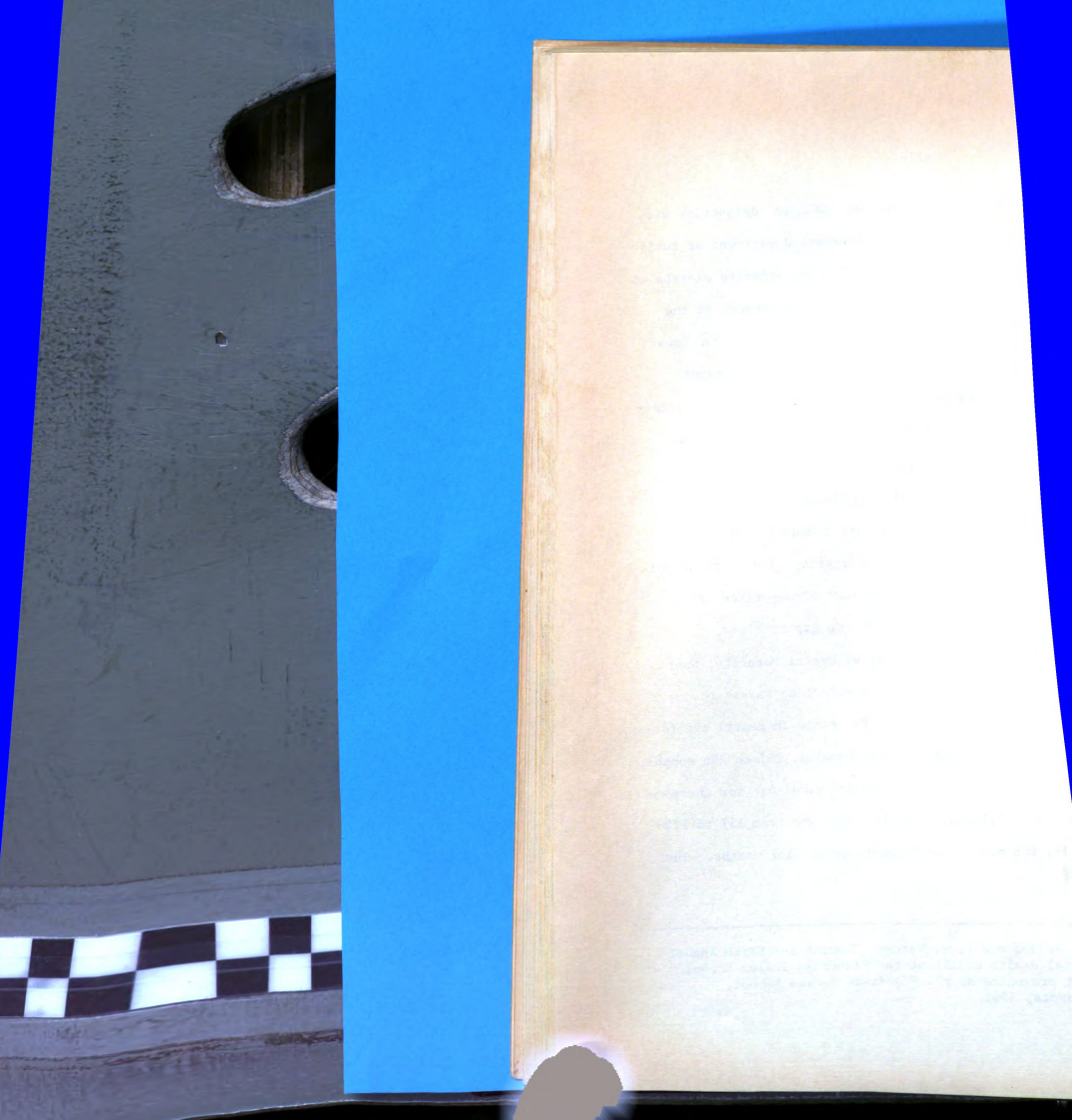
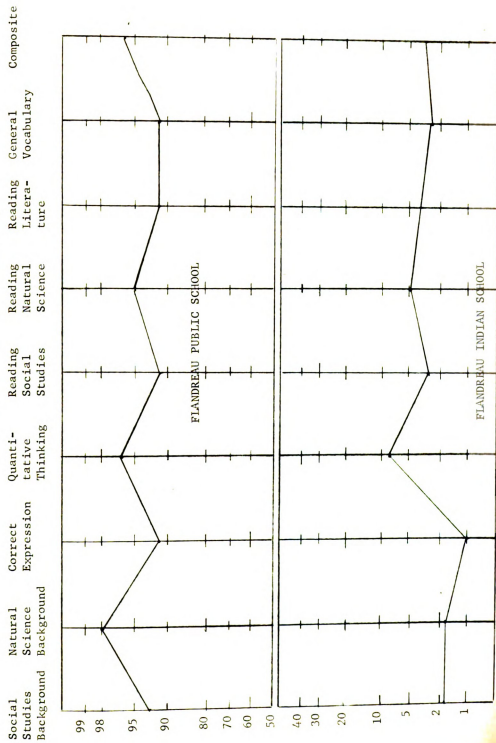


TABLE 2.1

SCHOOL NORM PERCENTILES FOR IOWA TESTS OF EDUCATIONAL DEVELOPMENT

(Mean Scores for Five Classes 1959-61)



Kizer³ reports a study of the Sioux Indian in South Dakota with the conclusion that although the I. Q. was almost normal there was a retardation of approximately two and a half years in academic accomplishments.

Hansen⁴ compared achievement of the Indian and the white students by administering an achievement test to students in selected public high schools and Indian boarding schools.

White students were definitely superior in general achievement to Indian students, showing more superiority to full-blood than to half-blood Indians.

There was no clear cut difference in achievement between the public high school children and those educated in the segregated atmosphere of the boarding school.

Turner and Penfold⁵ explored the aptitude of the Indian student to achieve in academic school subjects. They concluded that the total group and the various age groups of the Indians have significantly lower scholastic aptitude than a comparable group of white students. The abilities of the Indians and the whites cover much of the same range, and superior Indian children are above the average whites. The importance of environmental differences was emphasized.

³William M. Kizer, "History of the Flandreau Indian School." Unpublished Master of Arts Thesis, University of South Dakota, 1940.

⁴H. C. Hansen, "Scholastic Achievement of Indian Pupils." Journal of Genetic Psychology, Vol. 50, 1937, pp. 361-369.

⁵G. H. Turner and D. J. Penfold, "The Scholastic Aptitude of Indian Children." Canadian Journal of Psychology, 1952, pp. 31-44.

Hansen⁶ explored sex differences in achievement and compared the results with white students. The Tracy Short-Answer Achievement Test was administered to the sample; boys excelled in social science, girls in English and penmanship. The white sample scored better than Indians in all tests except handwriting. There were greater sex differences among Indian students.

Cowen⁷ studied the relationship of achievement to I. Q. among the Indian students in grades four through six and nine through twelve in the state of New York. The Kuhlmann-Anderson test and an achievement test were given to the entire sample; the elementary group's median M.A.'s were above grade norms, but 46 per cent were achieving below their grade level. In general, achievement was below that of corresponding white groups. Students in grades nine through twelve had mean achievement scores below the mean for the white group in the ninth grade.

Havighurst⁸ participated in a study of Indian education, which investigated the lives of Indians in six major tribes. His conclusions are summarized as follows:

⁶H. C. Hansen, "Relationship Between Sex and School Achievement On One Thousand Indian Children." Journal of Social Psychology, Vol. 10, 1939, pp. 399-406.

⁷P. A. Cowen, "Testing Indian Students in the State of New York." Mental Hygiene, 1943, pp. 80-86.

⁸Robert J. Havighurst, "Education Among the American Indians." American Academy of Political and Social Science, Vol. 311, May, 1957, pp. 105-115.

"The culture of the Indian child equips him well or poorly for education in American schools, depending on how well his culture matches that of the American society which surrounds him. Motivation for school achievement, for instance, is poor by white standards among children of Indian tribes whose culture is based on cooperation rather than competition. Innately, Indian children have about the same mental equipment as have white children, but their cultural status and experiences cause them to rank lower on educational achievement tests, especially in high school subjects."

Educators have doubted the intellectual abilities of Indian children and have ascribed to mental deficiency the difficulties which many Indian children experience in school. The I. Q.'s scored by all Indians in this Indian research project indicate that this is not true; nine of the eleven groups of Indian children tested in the six tribes had average I. Q.'s either above the white average or so little below it as to have no statistical significance.

The tests selected, to determine the ability to achieve, for the Dakota children were the Grace Arthur Point Performance Scale and the Goodenough Draw-A-Man Test. In the Arthur test, on which the average I. Q. for white children is 100, the children of Pine Ridge town, age six to fifteen, had an average I. Q. of 102.6 and the Kyle community children of the same ages recorded a mean I. Q. of 101.1. For the Goodenough Draw-A-Man Test, the average I. Q.'s were 102 for Pine Ridge and 113.6 for Kyle. Each group displayed the expected range from subnormal to superior intelligence.

These tests were designed to score intelligence through manual performance rather than through skill in writing English and using arithmetic and other school subjects. When the Indian students of

Oglala Community High School were given the Kuhlmann-Anderson Test, a mean I. Q. of 82.3 was recorded as compared with their score of 102.8 on the Arthur Test.

Havighurst cites the results of the same tests given to the Hopi Indian students by Thompson and Joseph in the same Indian research project. These groups had higher mean scores than the white children on whom the tests were standardized.

Recognizing that numerous studies have shown that there is a low correlation between the Indian student's ability to achieve and his actual achievement, Indian school educators have been seeking some reasons for the deficient school accomplishment. The Bureau of Indian Affairs, through Anderson, Collister, and Kron of the University of Kansas and Coombs⁹ from the U. S. Office of Indian Affairs, has conducted an extensive survey of the relationship of certain non-intellectual factors to achievement.

Information was gathered on 23,608 students; 58 per cent were Indian and 42 per cent were white. The complete battery of the California Achievement Tests, including tests on reading vocabulary, reading comprehension, arithmetic reasoning, arithmetic fundamentals, mechanics of English and grammar, and spelling were administered to each student. The study sought to explore the relationship between achievement and various factors.

⁹ L. M. Coombs, R. E. Kron, E. G. Collister, and K. E. Anderson, The Indian Child Goes To School. Haskell Press, Haskell, Kansas, 1958.

Relationship Between Achievement and Educational Aspiration

There is striking evidence that the higher achieving students expect to go further in school than do the low achievers. Assuming that a cause and effect relationship exists, it cannot be ascertained from the data whether high achievers expect to go further in school because they achieve well or whether they learn well because they are motivated by higher aspiration. Especially interesting is the fact that even at the fourth grade level the relationship between educational aspiration and achievement had begun to manifest itself.

Relationship Between Indian Blood; Pre-School Language and Achievement

With only one exception, the Albuquerque area, the smaller the amount of Indian blood in the group and the greater the amount of English spoken prior to school entrance, the higher the group achieved. It is not probable that blood quantum and pre-school language are strong determiners of achievement, but they are two of the best indices of the degree of acculturation which a pupil and his family have reached; this may have a powerful influence on achievement.

The Achievement of the Indian In the Various Skills

The white students achieved better on all of the tests than did the Indian students. The Indians compared most favorably with the white students in spelling and second best in arithmetic fundamentals; they compared least favorably in reading vocabulary and second poorest in arithmetic reasoning. The Indian students, generally, compared more

favorably with the white students in the elementary grades than in junior and senior high school.

Relationship Between Choice of Friends and Achievement

There was no significant differences in achievement between groups of Indians claiming that most of their friends were white and those who said most of their friends were Indian.

Relationship Between Regularity of Attendance and Achievement

As would be expected, pupils who attended school regularly tended to achieve better than those who were irregular in attendance. All other variables held equal, it is reasonable to assume that the regular school attender will achieve more.

Relationship Between the Proportion of White Students, In the School and Achievement

There may be a slight indication that Indian students attending a school of white students, or where the enrollment is at least half white, achieve better than those attending a school composed mostly of Indian students. The data are not conclusive.

The Relationship Between Age In Grade and Achievement

There is impressive evidence that students who are over age for their grade do not achieve as well in the basic skill subjects as those who are at-age or under-age. Over-ageness, itself, is not the only

contributor to the low achievement of the over-age students, but the same social, economic, and cultural factors which tended to make them over-age continue to operate against their learning.

Relationship Between Place of Residence and Achievement

The data yield strong evidence that Indian students who live away from an Indian reservation achieve better than those who live on one. The town dweller achieves somewhat better than the rural dweller.

SUMMARY

The early studies reported by Rowe and Crump generally assumed that the low achievement of the Indian student was due to inferior intellectual ability; later research by Havighurst, Thompson, and Joseph has tended to indicate an ability to achieve equal to that of their Caucasian counterparts. All studies reviewed, involving a comparison of the achievement of the Indian and white student, tend to indicate that the Indian does not achieve in academic subjects as well as the white student. Research, sponsored by the Bureau of Indian Affairs, through the University of Kansas, has explored the relationship of achievement to such non-intellectual factors as educational aspiration, regularity of school attendance, choice of friends, place of residence, amount of Indian blood, and age in grade.

Some of the studies reviewed might be criticized for inadequate sampling, and most of them for lack of statistical tests of significance. This study is an effort to add to the knowledge that has been

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accumulated relative to the problem and to overcome some of the limitations of former research.

CHAPTER III

DESIGN AND METHODOLOGY

The design of this study is described under three headings: 1) Sample Selection, 2) Nature of the Data, and 3) Analysis Procedures.

Sample Selection

There were two samples included in this study. An Indian sample was comprised of 100 males and 100 females selected from a population of 350 eleventh grade students from two South Dakota high schools.¹ Thirty-five tribes from seven of the midwestern states were represented in the two schools.

The Caucasian sample of 254 males and 261 females was involved in an earlier study conducted by Farquhar.² This sample was selected from 4200 eleventh grade students from nine Michigan high schools.

The Indian sample for the factor analysis was the same sample that was involved in the correlational analysis. The Caucasian male sample for this analysis was also a part of the Farquhar study.³

¹T. P. Krush, Anne J. Lello, J. W. Bjork, "Third Annual Report of the Mental Health Clinic at the Flandreau Indian High School." Flandreau, South Dakota, 1959.

²William 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.

³Marion 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.

In summary, for the correlational analysis there were 100 Indian and 254 Caucasian males; 100 Indian and 261 Caucasian females. For the factor analysis, there were 100 Indian and 308 Caucasian males.

Nature of the Data

Three types of data were gathered on each student: 1) aptitude score, 2) grade point average, and 3) motivational score.

Aptitude Measure

The aptitude measure was the verbal form of the Differential Aptitude Tests (DAT-VR). A description of the DAT-VR may be found in the manual.⁴

Grade Point Average

The grade point average (GPA) was computed for each individual using grades received in ninth and tenth grade academic subjects, i.e., subjects requiring homework.

Motivational Score

The motivational score was obtained from the student's responses to the Michigan M-Scales. This scale is comprised of four sub-tests: 1) Generalized Situational Choice Inventory, 2) Word Rating List, 3) Human Traits Inventory, and 4) Preferred Job Characteristics Scale.

⁴The Psychological Corporation, Manual for the Differential Aptitude Tests, New York, 1959.

Reliability

With a sample of 100 Indian males and a sample of 100 Indian females, a Hoyt's analysis of variance estimate for the total M-Scales was obtained. The reliability estimate for the male population was .91 and a comparable satisfactory reliability estimate of .91 for the female was recorded. The reliability estimates for all sub- and total scores are reproduced in Table 3.1.

Analysis Procedures

Three procedures were utilized in the analysis of the data: 1) mean test of significance, 2) multiple regression analysis, and 3) factor analysis.

Mean Test of Significance

The t-test was used to test the difference between the Indian and Caucasian responses to the Michigan M-Scales.

Multiple Regression Analysis

A multiple regression analysis was performed to predict the Grade Point Average (GPA) from the 1) Generalized Situational Choice Inventory (GSCI), 2) Word Rating List (WRL), 3) Preferred Job Characteristics Scale (PJCS), 4) Human Traits Inventory (HTI), and 5) Differential Aptitude Test-Verbal Form (DAT-VR).

The multiple regression equations were solved using the general linear hypothesis and least squares estimates of the β 's. This method

TABLE 3.1

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

Sub-Test	N	Indian Males Reliability Estimate	Indian Females Reliability Estimate
GSCI ¹	100	.77	.62
WRL ²	100	.96	.87
PJCS ³	100	.86	.88
HTI ⁴	100	.29	.70
M-Scales Total	100	.91	.91

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

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

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

⁴Based on 25 items for males and 33 items for females

is developed by Kempthorne in his book, Design and Analysis of Experiments.⁶ The Michigan State University high speed digital computer, Mistic, with a K-16M program, was utilized in the analysis. The assumption is made that a multivariate-normal population has been sampled.

Factor Analysis

A factor analysis of the Indian males' responses to 22 selected items of the GSCI was conducted and compared with the factorial structure of the Caucasian male responses to the same test.⁷

In order to compare factors derived from the two analyses, the same factor analytic solution used by Thorpe⁸ was used in this study. The entire scale (45 items) was also factor analyzed in order to more thoroughly understand 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 was obtained using a M 23M program.⁹
2. The principle axis solution was employed to factorize the matrix, using an M 20M program.
3. The factors were rotated to simple structure by the quartimax method of factor rotation. The K-11 program was used for this part of the analysis.

⁶Oscar Kempthorne, Design and Analysis of Experiments, John Wiley and Sons Book Company, New York, 1952.

⁷William W. Farquhar, op. cit.

⁸Marion D. Thorpe, op. cit.

⁹The entire program was performed by the Michigan State University high speed digital computer, Mistic.

Null Hypotheses

The following are restatements of the hypotheses in null form, i.e., the hypothesis that there is no true difference between the two samples as they relate to the criterion.

- Ho₁ There is no significant difference in mean scores on the four sub-tests of the M-Scales between Indian and Caucasian males and females.
- Ho₂ There is no significant difference in mean scores on the total M-Scales between Indian and Caucasian males and females.
- Ho₃ There is no significant difference in mean grade point average between Indian and Caucasian males and females.

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

- Ho₄ The M-Scales when combined with an aptitude measure will increase the precision of prediction of academic achievement (GPA) for Indian males and females.
- Ho₅ The M-Scales when combined with an aptitude measure will yield greater precision of prediction for males than females.
- Ho₆ The factor analysis of the male Indian responses to the GSCI will yield a structure different to that found for Caucasians.

SUMMARY

An Indian sample was drawn from South Dakota high schools where students from 35 tribes from seven midwestern states were in attendance. To study the predictive efficiency of the M-Scales, the design was based on correlational analysis while the factored dimensions of the M-Scales were studied through factor analysis. The results of this

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analysis were compared with results obtained by Farquhar in a study based on eleventh grade Caucasian students.¹⁰

¹⁰William W. Farquhar, op. cit.

CHAPTER IV

STATISTICAL ANALYSIS

This chapter presents the analysis of 1) the mean tests of significance between Indian and Caucasian male and female responses to the four sub-tests and the total scores of the M-Scales; 2) the correlational and multiple regression analysis to evaluate the relationship between the M-Scales and the DAT-VR score; and, 3) the factor analysis of the Indian male responses to the GSCI.

Difference Between Indian and Caucasian Mean Scores*

The Null hypothesis tested for each of the sub-tests was:

Ho₁ There is no significant difference in mean scores of the four sub-tests of the M-Scales between Caucasian and Indian males and females.

The t-ratios of -2.140 and -6.000 for males and females respectively indicate differences in GSCI mean scores that are significant at the .05 level; thus, the null hypothesis of no difference between the Caucasian and Indian mean scores for this sub-test was rejected for both males and females.

The WRL t-ratios of 2.512 for males and 3.196 for females were significant; therefore, the null hypotheses of no difference in mean scores were rejected.

The HTI sub-test produced t-ratios of 3.194 and 1.832 for males and females respectively. The hypothesis of no difference in mean

* Tables 4.1 and 4.2 present mean scores, standard deviations, and t-ratios for Indian and Caucasian male and female samples.

scores of this sub-test was rejected for the males and accepted for the females.

Male responses to the PJCS produced a t-ratio of 1.740 which was not significant while the t-ratio of 2.462 for the females was significant; therefore, the null hypothesis was accepted for the males, but rejected for the females.

Ho₂ There is no significant difference in mean scores on the total M-Scales between Caucasian and Indian males and females.

The t-ratio of 2.570 obtained from the male samples indicated a difference in mean scores that was significant at the .05 level; thus, the hypothesis of no difference in total M-Scales scores was rejected.

The t-ratio for the female sample was .307. This was not significant; thus, the hypothesis of no difference in mean scores on the total M-Scales was accepted for the females.

Ho₃ There is no significant difference in mean grade point average between Indian and Caucasian males and females.

The Caucasian grade point averages of 2.94 and 3.27 were higher than the averages of 2.67 and 2.93 earned by Indian males and females, respectively. The t-ratios of 3.410 for the males and 4.359 for the females were significant at the .05 level; thus, the null hypotheses of no difference in grade point average were rejected for both males and females.

TABLE 4.1

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

VARIABLE	TOTAL POSSIBLE SCORE	CAUCASIAN (N=254) MEAN	S.D.	INDIAN (N=100) MEAN	S.D.	d.f.	t
Grade Point Average	5.00	2.94	.72	2.67	.55	252	3.410*
GSCI	45	30.76	6.89	32.41	5.36	252	-2.140*
HTI	26	18.97	4.41	15.30	2.54	252	3.194*
PJCS	20	16.20	4.32	15.60	4.32	252	1.740
WRL	48	30.41	9.69	27.51	8.50	252	2.512*
Total M-Scales	139	96.39	20.01	90.82	16.42	252	2.570*
DAT-VR	40	19.91	8.59	16.01	8.90	252	3.451*

* $p < .05$ > 1.970

Significant differences in GPA, GSCI, HTI, WRL, Total M-Scales, and DAT-VR.



TABLE 4.2

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

VARIABLE	TOTAL POSSIBLE SCORE	CAUCASIAN (N=261)		INDIAN (N=100)		d.f.	t
		MEAN	S.D.	MEAN	S.D.		
Grade Point Average	5.00	3.27	.66	2.93	.66	359	4.359*
GSCI	30	20.45	5.11	23.21	3.34	359	-6.000*
HTI	25	17.51	3.60	16.59	4.51	359	1.832
PJCS	33	27.44	5.78	28.91	4.78	359	-2.462*
WRL	48	28.99	8.29	25.88	8.27	359	3.196*
Total M-Scales	136	94.93	18.69	94.38	13.72	359	.307
DAT-VR	40	20.00	7.76	16.28	7.25	359	4.335*

* p .05 > 1.967

Significant differences in GPA, GSCI, PJCS, WRL, and DAT-VR.

TABLE 4.3

INTERCORRELATIONS AMONG ACHIEVEMENT, APTITUDE
AND M-SCALES SUB-TESTS FOR INDIAN MALES
(N=100)

	GSCI	PJCS	WRL	HTI	DAT-VR	GPA
GSCI		.67*	.50*	.50*	.17	.35*
PJCS			.41*	.40*	.28*	.29*
WRL				.33*	.23*	.33*
HTI					.08	.05
DAT-VR						.41*

* p .05 for the test that $r=0$, if $r > .195$ at the .05 level

Correlational Analysis

Ingercorrelations of the M-Scales sub-tests with each other, with the DAT-VR, and with GPA are shown in Tables 4.3 and 4.4.

Correlations between the sub-tests range from .33 to .67 for the males and from .21 to .56 for the females.

Except for the HTI male sample and the PJCS female sample, all of the sub-tests correlated with GPA with statistical significance. The GSCI, when applied to the male sample, produced a higher correlation with grade point average than any of the other sub-tests when applied to either males or females. The M-Scales total and GPA correlation was .38 for the males and .32 for the females.

TABLE 4.4

INTERCORRELATIONS AMONG ACHIEVEMENT, APTITUDE
AND M-SCALES SUB-TESTS FOR INDIAN FEMALES
(N=100)

	GSCI	PJCS	WRL	HTI	DAT-VR	GPA
GSCI		.39*	.30*	.46*	.14	.20*
PJCS			.21*	.40*	.28*	.10
WRL				.56*	.30*	.30*
HTI					.18	.29*
DAT-VR						.43*

* p .05 for the test that $r=0$, if $r > .195$ at the .05 level

The PJCS and the WRL had significant correlations with the DAT-VR; however, this was not true for either the GSCI or the HTI in either the male or the female samples.

In this study of the American Indian, the DAT-VR produced higher correlations with GPA than any of the M-Scales sub-tests; this was true for both the male and female samples. The correlation for the males was .41 and .43 for the females.

Multiple Regression Analysis

Table 4.5 contains the multiple regression equation for the prediction of GPA for the Indian males and females from an aptitude



measure, the DAT-VR, plus the four sub-tests of the M-Scales. The hypotheses tested were:

- Ho₄ The M-Scales when combined with an aptitude measure will increase the precision of prediction of academic achievement for Indian males and females.
- Ho₅ The M-Scales when combined with an aptitude measure will yield greater precision of prediction for males than females.

TABLE 4.5

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

BETA WEIGHTS		MULTIPLE R
Males (N=100)	.195(GSCI) + .004(PJCS) + .103(WRL) + -.246(HTI) + .282(DAT-VR)	= .52
Females (N=100)	.103(GSCI) + -.029(PJCS) + .064(WRL) + .246(HTI) + .332(DAT-VR)	= .49

The DAT-VR had a correlation of .41 with GPA for Indian males and .43 for Indian females. When the four sub-tests of the M-Scales were added to the DAT-VR to predict GPA, the multiple regression equation produced a correlation of .52 for males and .49 for females. Therefore, the hypothesis that the M-Scales, when added to an aptitude test, will increase the precision of prediction of academic achievement for Indian males and females was accepted.

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The increase in correlations from .41 to .52 for males and from .43 to .49 for females permitted the acceptance of the hypothesis that the M-Scales, when combined with an aptitude measure, will yield greater precision of prediction for males than females.

The beta weights for both aptitude and the M-Scales were significantly different from zero for both males and females. The t-betas are as follows:

Males -- $GPA = 1.443 + .098 (M-Scales) + .210 (DAT-VR)$
t-beta = 5.28, $p < .05$ for the test that $\beta = 0$.

Females -- $GPA = 1.511 + .093 (M-Scales) + .333 (DAT-VR)$
t-beta = 4.19, $p < .05$ for the test that $\beta = 0$.

Therefore, the improvement in the precision of predicting GPA by adding the M-Scales to the DAT-VR is statistically significant; however, in this study of the American Indian, the DAT-VR appeared to be a better predictor of GPA than the M-Scales.

Factor Analysis

To resolve both the 22 and 45 variable problems, the principle axis solution was used and the quartimax orthogonal method of rotation enabled a simplified interpretation of the analysis. In order to provide a logical comparison with Thorpe's¹ analysis of the Caucasian male students, each factor in the 22 variable problem had to have at least two highest loadings to be considered significant.

¹Marion 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.

For a meaningful interpretation of the factors in the 45 variable problem, at least three heaviest loadings were required per factor.²

Results of the 22 Variable Factor Analysis

A logical comparison of the factor analysis results of this research was made with the results of the analysis by Thorpe³ conducted on eleventh grade Caucasian males in the state of Michigan. Five factors accounted for most of the variance among the items. Thorpe described the five rotated factors as: 1) chance taking versus no chance taking, 2) n-academic achievement, 3) intrinsicness versus extrinsicness, 4) speed versus thoroughness, and 5) situational involvement. This study conducted on eleventh grade Indian males indicated that seven factors accounted for most of the variance among the items. The factors with their item content and the loading of each item are presented in Tables 4.6 through 4.12.

Factor I (intrinsicness versus extrinsicness) accounts for more variance of the items than any of the other factors. Items 66 and 77 loaded highest on this factor. They suggest a choice of materialism or non-materialism. The same two items were found in Factor III of Thorpe's analysis which he characterized as intrinsicness versus extrinsicness. Item 46 did not load as high as the other two items; this item presents the alternatives of thought or action.

²M. A. Williams, Personal Communication, Computer Center, Michigan State University.

³Marion D. Thorpe, op. cit.

Four items loaded highest on Factor II (n-academic.achievement). Items 11, 55, and 59 concern long or short term involvement with academic work. The same items appear in Thorpe's Factor II, which he depicted as an n-academic achievement factor.

Items 20, 33, and 44 loaded highest on Factor III. These items required the student to respond to speed versus thoroughness alternatives. Factor III is similar to Thorpe's Factor IV which he characterized as speed versus thoroughness.

Thorpe's Factor I, chance taking versus non-chance taking, accounted for more variance of the items than any other factor in his study. This research indicates that Factor IV is very similar to his Factor I. Items 13, 38, and 39 loaded heaviest on Factor IV; all three present the choice of chance taking versus non-chance taking.

Factor V contained items 9, 16, 23, and 50; all of these items are concerned with situations, time, or degree of involvement; this factor has much in common with Thorpe's Factor V, which he chose to define as a situational involvement factor.

Items 36 and 41 loaded highest on Factor VI; both items suggest components of competition; thus, the factor may be characterized by the term competitiveness versus non-competitiveness. This may be a factor unique to the Indian motivational pattern.

Item 15 has the heaviest loading on Factor VII; it emphasizes unique versus common accomplishment in conjunction with chance taking. Item 6 also loaded highest on this factor and, to a lesser degree, may be characterized by unique versus common accomplishment.

The hypothesis for the 22 variable factor analysis for the Indian male was:

The analysis will yield a factorial structure different in nature from that found for the Caucasians.

Factors I, II, III, IV, and V appear to be similar to the five factors found by Thorpe; however, the factors arrived at in this study are not in the same order, according to the amount of variance accounted for, as were the factors in the study of the Caucasians. Factors VI (competitiveness versus non-competitiveness) and VII (unique versus common accomplishment) are unique to the study of the Indian male population. There are elements of the motivational pattern that Indian and Caucasian eleventh grade boys have in common. The addition of the two additional factors (VI and VII) and the limited variations found within the other five factors do not seem to confirm the hypothesis that the factor analysis yields a factorial structure for the Indian male student different in nature from that found for the Caucasian.

Results of the 45 Variable Factor Analysis

The results of the 45 item factor analysis indicate that eight factors account for most of the variance among the items. Tables 4.13 through 4.20 present the eight factors with their item content and loading.

Factor I is characterized as an n-achievement factor; of the five items that loaded heaviest on this factor, items 11, 55, and 59 also loaded heaviest on the n-achievement factor in the 22 item factor analysis.

TABLE 4.6*

FACTOR I**

Item Number and Content	Loading
66. a. Be very happy, or	
b. Have lots of money	+.744
77. a. Discover a gold mine, or	
b. Discover a new medicine	+.689
46. a. Think of an idea that nobody has ever thought of, or	
b. Set a world's speed record	+.502

* Tables 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, and 4.12 pertain to the 22 item factor analysis.

** Intrinsicness versus extrinsicness

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	-.805
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	-.725
11. a. Be well prepared for a job after graduation from high school, or	
b. Be well prepared to continue learning	-.583
18. a. Get excellent grades because I have a great deal of ability, or	
b. Get average grades because I have average ability	-.442

* n-academic achievement

TABLE 4.8

FACTOR III*

Item Number and Content		Loading
33.	a. Work rapidly just "skimming" along, or b. Work slowly with great thoroughness	-.794
20.	a. Make quick decisions and sometimes be right and sometimes wrong, or b. Deliberate over decisions and usually be right	-.670
44.	a. Study my assignments during study hall, or b. Wait to study until the mood strikes me	-.500

* Speed versus thoroughness

TABLE 4.9

FACTOR IV*

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	-.806
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	-.603
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 gives only "C"'s	-.569

* Chance taking versus non-chance taking

TABLE 4.10

FACTOR V*

Item Number and Content		Loading
50.	a. Do what I think is right, or	
	b. Do what others think is right	-.688
16.	a. Be successful in finishing a job, or	
	b. Finish a job	-.652
9.	a. Have the best teachers in the state in my school, or	
	b. Have a large recreation center in my school	-.559
23.	a. Be allowed to take extra courses before, or after school, or	
	b. Just take courses offered during the school day	+.401

* Situational involvement

TABLE 4.11

FACTOR VI*

Item Number and Content	Loading
41. a. Be paid for the <u>amount</u> of work I did, or	
b. Be paid by the hour	-.676
36. a. Have a great deal of money, or	
b. Be an expert in my favorite school subject	-.571

* Competitiveness versus non-competitiveness

TABLE 4.12

FACTOR VII*

Item Number and Content	Loading
15. a. Develop a <u>new</u> product which may or may not be good, or	
b. Make a product as good as the best one available	-.803
6. a. Receive a grade on the basis of how well I did on the teacher's test, or	
b. Get a grade on the basis of how hard I tried	+.486

* Unique versus common accomplishment

Competitiveness versus non-competitiveness characterizes Factor II. Items 19, 27, and 35 loaded heaviest on this factor.

Items 13, 38, and 66 loaded heaviest on Factor III; items 13 and 38 suggest naming the factor, chance taking versus non-chance taking. The same two items were found in the chance taking versus non-chance taking factor in Thorpe's 22 item factor analysis.

Items 6, 9, and 23 loaded heaviest on Factor IV; 9 and 23 comprised a part of Thorpe's Factor V which he also characterized as situational involvement or academic interests versus non-academic interests.

Intrinsicness versus extrinsicness characterizes items 19, 62, and 77 which loaded heaviest on Factor V. Item 19 may be interpreted as a security versus insecurity item.

Factor VI is unique to the 45 item factor analysis in this study. The three items loading heaviest on the factor, 29, 65, and 67, all suggest decision making with adequacy of self or inadequacy of self as the principle determinant.

Factor VII is similar to Factor III of the 22 item analysis; items 20, 33, and 44 loaded heaviest on this speed versus thoroughness factor in both cases. The unique item, 68, suggests common versus unique accomplishment.

Items 15, 64, 70, and 71 loaded heaviest on Factor VIII; items 64 and 70 cause the factor to be viewed as a unique versus common accomplishment factor. Item 15 may be described as an n-academic achievement item.

TABLE 4.13*

FACTOR I**

Item Number and Content	Loading
59. a. Study to go to college, or b. Study to get out of high school	-.826
55. a. Wait until I had finished college and make more money, or b. Get a job right after high school and make a good salary	-.766
52. a. Work overtime to make more money, or b. Get more schooling to make more money	-.452
11. a. Be well prepared for a job after graduation from high school, or b. Be well prepared to continue learning	-.451
1. a. Avoid failing in school, or b. Do well in school	-.406

* Tables 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, and 4.20 pertain to the 45 item factor analysis.

** n-academic achievement

TABLE 4.14

FACTOR II*

Item Number and Content		Loading
19.	a. Be graded at the end of a course with the possibility of making an "A", or	
	b. Get a "C" at the beginning of a course with everyone else	-.638
27.	a. Do as well as most of my classmates, or	
	b. Be better than most of my classmates	-.627
35.	a. Have a better job than my father has, or	
	b. Have a job like my father has	+.417

* Competitiveness versus non-competitiveness

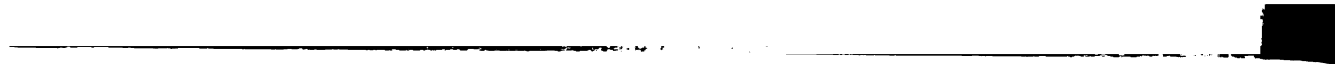


TABLE 4.15

FACTOR III*

Item Number and Content		Loading
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	-.746
38.	a. Have everyone 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	-.618
66.	a. Be very happy, or	
	b. Have lots of money	+.557

* Chance taking versus non-chance taking



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TABLE 4.16

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	-.729
6.	a. Receive a grade on the basis of how well I did on the teacher's test, or	
	b. Get a grade on the basis of how hard I tried	-.412
23.	a. Be allowed to take extra courses before or after school, or	
	b. Just take courses offered during the school day	-.380

* Situational involvement or academic interest versus non-academic interest



TABLE 4.17

FACTOR V*

Item Number and Content		Loading
62.	a. Have a great deal of influence over people, or	
	b. Have a great deal of ambition	-.794
19.	a. Be paid for how well I did a job, or	
	b. Be paid the same amount no matter how I did the job	-.423
77.	a. Discover a gold mine, or	
	b. Discover a new medicine	-.382

* Extrinsicness versus intrinsicness



TABLE 4.18

FACTOR VI*

Item Number and Content		Loading
67.	a. Be known as a person who knows his own mind, or b. Be known as a person who gets help in making decisions	+.678
65.	a. Be known as being a "good guy", or b. Be known as a person who "does things well"	+.608
29.	a. Do what I think is right, or b. Do what others think is right	+.506

* Adequacy of self versus inadequacy of self

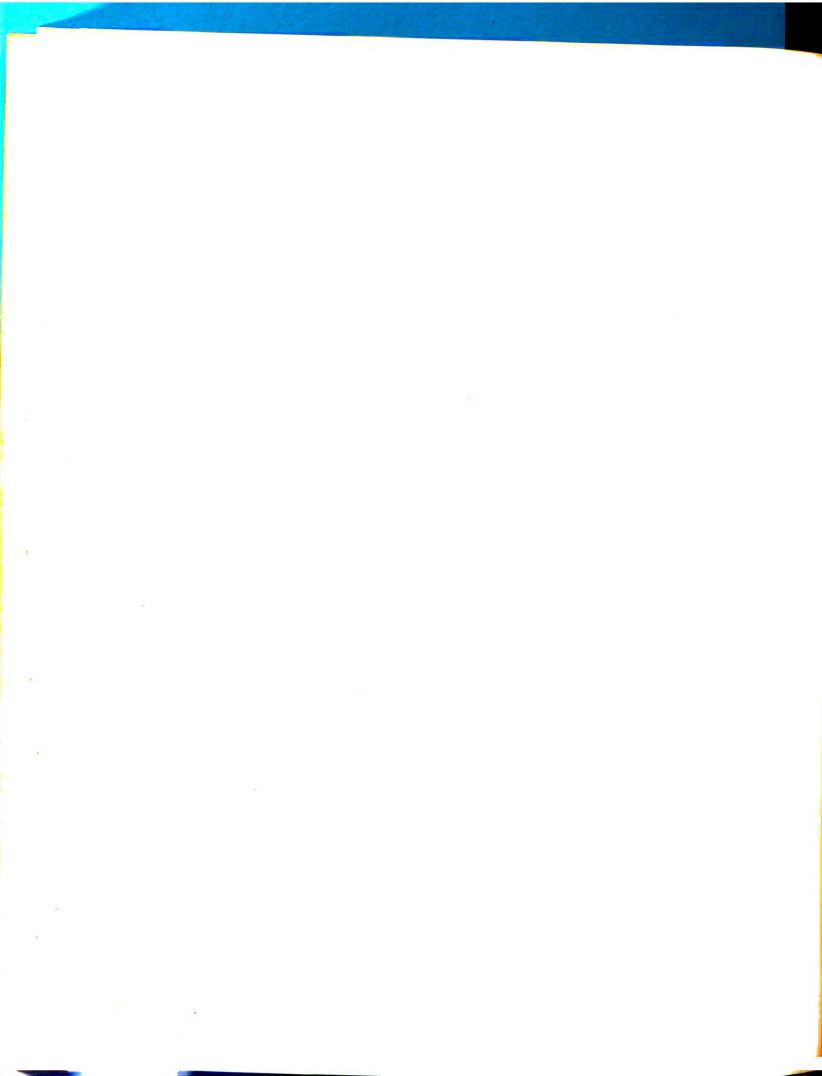


TABLE 4.19

FACTOR VII*

Item Number and Content	Loading
33. a. Work rapidly just skimming along, or	-.748
b. Work slowly with great thoroughness	
20. a. Make quick decisions and sometimes be right and sometimes wrong, or	-.739
b. Deliberate over decisions and usually be right	
68. a. Do something like everyone else, or	-.419
b. Do something outstanding	
44. a. Study my assignments during study hall, or	-.394
b. Wait to study until the mood strikes me	

* Speed versus thoroughness

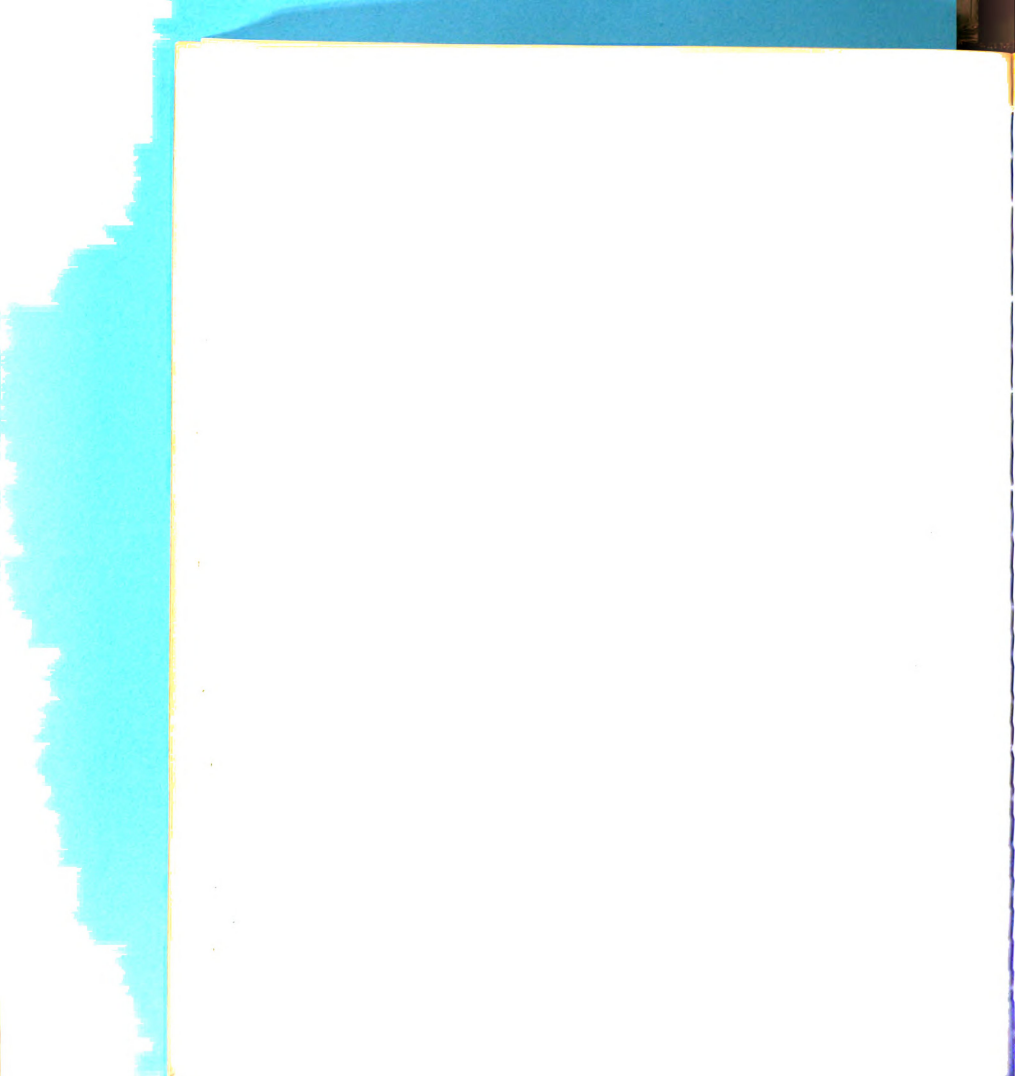


TABLE 4.20

FACTOR VIII*

Item Number and Content		Loading
64.	a. Carry out the plans of others, or b. Create something of my own	-.738
15.	a. Receive money for my good grades, or b. Be allowed to take any course I wanted because of good grades	-.560
70.	a. Put together a new object, or b. Develop new ideas	-.545
71.	a. Be demanding on myself to do good work, or b. Be demanding on my friends so that they will do good work	-.437

* Unique versus common accomplishment



A logical comparison of the results of the 22 and 45 item factor analyses indicates that the latter analysis gives support to the former. The seven factors derived in the 22 item analysis were also derived in the 45 item analysis; there was considerable, but not total, overlap in items found in the factors of the two analyses. Factor VI, adequacy of self versus inadequacy of self, was unique to the 45 item factor analysis.

SUMMARY

In testing the difference in mean scores earned by the Caucasian and Indian males and females, t-ratios indicated differences significant at the .05 level in grade point average, aptitude, the GSCI, and the WRL for both males and females. For the male sample, significant differences were also found in mean scores earned in the HTI and the total M-Scales; the female samples showed scores of significant difference in the PJCS, but not in the HTI and the total M-Scales.

The male sample showed significant correlations of all the M-Scales, except the HTI, with GPA, while the female sample produced significant correlations for all but the PJCS sub-test. The correlation of the DAT-VR with GPA was .41 for the males and .43 for the females; in both cases the R was significant at the .05 level.

The regression analysis indicated that the DAT-VR accounted for more of the variance than the M-Scales; however, the M-Scales did increase the precision of prediction of GPA for both males and females. The t-betas for both the M-Scales and the DAT-VR in the prediction of GPA were significant at the .05 level for both Indian males and females.



A logical inspection of the factors derived in the 22 item factor analysis of the Indian male responses to selected items of the GSCI does not support the hypothesis that the analysis would yield a factorial structure different in nature from that found for the Caucasians. Although there were many pattern similarities, there was some difference in factorial structure and some factors found in the study of the Indians were not derived in the Caucasian study. The results of the 45 item factor analysis supported the findings of the 22 variable factor analysis and one new factor was added to Indian motivational pattern. Table 4.21 presents the factors of the three analyses.

1. The first step in the process is to identify the problem or issue that needs to be addressed.

2. Once the problem is identified, the next step is to gather relevant information and data.

3. After gathering information, the next step is to analyze the data and identify the root cause of the problem.

4. Once the root cause is identified, the next step is to develop a plan of action to address the problem.

5. The final step in the process is to implement the plan and monitor the results to ensure the problem is resolved.

6. It is important to document the entire process and the results of the analysis and implementation.

7. The process should be reviewed regularly to ensure it remains effective and up-to-date.

8. The process should be communicated to all relevant stakeholders to ensure they are aware of the problem and the solution.

9. The process should be flexible and adaptable to changes in the problem or the environment.

10. The process should be a continuous cycle of improvement, with regular feedback and evaluation.

11. The process should be supported by appropriate resources and tools.

12. The process should be a collaborative effort involving all relevant stakeholders.

13. The process should be a key part of the organization's overall strategy and culture.

14. The process should be a continuous effort to improve the organization's performance and efficiency.

15. The process should be a key part of the organization's commitment to excellence and continuous improvement.

16. The process should be a key part of the organization's commitment to transparency and accountability.

17. The process should be a key part of the organization's commitment to innovation and creativity.

18. The process should be a key part of the organization's commitment to sustainability and social responsibility.

19. The process should be a key part of the organization's commitment to customer satisfaction and loyalty.

20. The process should be a key part of the organization's commitment to employee well-being and engagement.

TABLE 4.21

SUMMARY OF FACTORS FOR THE FACTOR ANALYSES

CAUCASIAN MALES (22 Items)	INDIAN MALES (22 Items)	INDIAN MALES (45 Items)
1. Chance taking versus no chance taking	1. Intrinsicness versus extrinsicness	1. n-academic achievement
2. n-academic achievement	2. n-academic achievement	2. Competitiveness versus non-competitiveness
3. Intrinsicness versus extrinsicness	3. Speed versus thoroughness	3. Chance taking versus no chance taking
4. Speed versus thoroughness	4. Chance taking versus no chance taking	4. Situational involvement
5. Situational involvement	5. Situational involvement	5. Intrinsicness versus extrinsicness
	6. Competitiveness versus non-competitiveness	6. Adequacy of self versus inadequacy of self
	7. Unique accomplishment versus common accomplishment	7. Speed versus thoroughness
		8. Unique accomplishment versus common accomplishment



CHAPTER V

SUMMARY AND RECOMMENDATIONS

The purpose of this study was dual, the primary purpose being to study the predictive efficiency of the M-Scales when applied to an American Indian sample. This was an effort to ascertain whether or not the M-Scales, when applied to that population, would be a means of increasing the precision of prediction of academic achievement.

The secondary purpose of this research was to study the structure of whatever motivation does exist for the American Indian. The factorial structure of the Indian male responses were logically compared to the factorial structure of the Caucasian male responses to the GSCI found in an earlier study.¹

The M-Scales scores on each sub-test and the total test, the GPA, and an aptitude test score (the DAT-VR) were obtained for each Indian male and female in the study. From this data, mean scores were computed and compared with the mean scores of a Caucasian sample studied previously.² Statistically significant differences occurred in GPA, DAT-VR, GSCI, and WRL mean scores for Indian and Caucasian males and females. A significant difference was found in the male HTI mean

¹Marion 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.

²William 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.



scores, but not in the PJCS scores. The female samples showed mean scores of no significant difference in the HTI and total M-Scales; however, a significant difference was found in the PJCS scores.

Correlations between each of the sub-tests of the M-Scales as well as correlations of the sub-tests and the DAT-VR and CPA were ascertained. Significant correlations were found for the DAT-VR and all sub-tests of the M-Scales with GPA, except for the HTI in the male sample and the PJCS in the female sample.

A multiple regression equation was computed for both the male and female samples; the four tests of the M-Scales and the aptitude measure were combined to predict GPA. The regression equation indicated a multiple correlation of .49 for the females and .52 for the males. The beta weights of both the aptitude and M-Scales were tested and both were found to be significantly different from zero at the .05 level.

The factor analysis did not support the hypothesis that a factorial structure, different in nature from that found for the Caucasians, would be derived in the analysis of the Indian responses. Five factors were held in common by the two samples; however, without total overlap. There were two factors derived in this study unique to the Indian sample. The two factors are: 1) common accomplishment versus unique accomplishment, and 2) competitiveness versus non-competitiveness.

CONCLUSIONS

The analysis of the data permits the following conclusions:

11

1. The grade point average earned by the Caucasian male and female was significantly greater than that earned by their Indian counterparts.

2. The difference in academic ability as measured by the DAT-VR indicates that the Indian male and female have significantly less aptitude to achieve in school work than the Caucasian student has.

3. Except for the HTI in the male sample and the PJCS in the female sample, each of the sub-tests of the M-Scales significantly correlates with grade point average (.29 to .35 for the males and .20 to .30 for the females).

4. The multicorrelations indicate that the DAT-VR is a more effective predictor of school achievement for the Indian than the M-Scales; however, the M-Scales, when added to the aptitude measure, does increase the precision of prediction of grade point average.

5. The multicorrelations indicate that the combination of the DAT-VR with the M-Scales provides a more precise predictor of grade point average for males than females.

6. The factor analysis indicated that factors pertaining to achievement motivation were held in common by the Indian and Caucasian samples; however, there were differences in factorial structure and factors unique to the Indian sample were derived.

DISCUSSION

In that this study has been exploratory in nature, there are some results of the research that warrant further discussion.



Difference In Mean GSCI Scores

"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 logical hypothesis would be that the Caucasian students would record higher scores than their Indian counterparts when responding to the GSCI; however, in this study, the contrary was true. The Indian students' scores were significantly higher than the Caucasian scores. One interpretation of the above finding could be that the Indian students have a significantly greater need for academic achievement than the Caucasians. This might be partially explained by MacGregor's⁴ conclusion, "This interest in getting an education is one of the few signs of interest in getting ahead, acquiring some preparation for life, and, in general, trying to mature." Generally, the above is contrary to hypotheses proposed by other researchers working with Indian samples. Havighurst⁵ found the Indians' motivation for education poor by white standards, especially when a tribe had lost its traditional culture and not yet successfully fitted into the white culture. "Most Indian groups have clung to enough of their traditional culture to prevent them from adopting fully the white American culture, including its attitudes

³William W. Farquhar, op. cit.

⁴Gordon MacGregor, Warriors Without Weapons. University of Chicago Press, Chicago, Illinois, 1946. p. 201.

⁵Robert J. Havighurst, "Education Among the American Indians." Journal of the American Academy of Political and Social Science, Vol. 311, May, 1957, p. 114.



toward education and its use of education as a means of social mobility and occupational achievement."

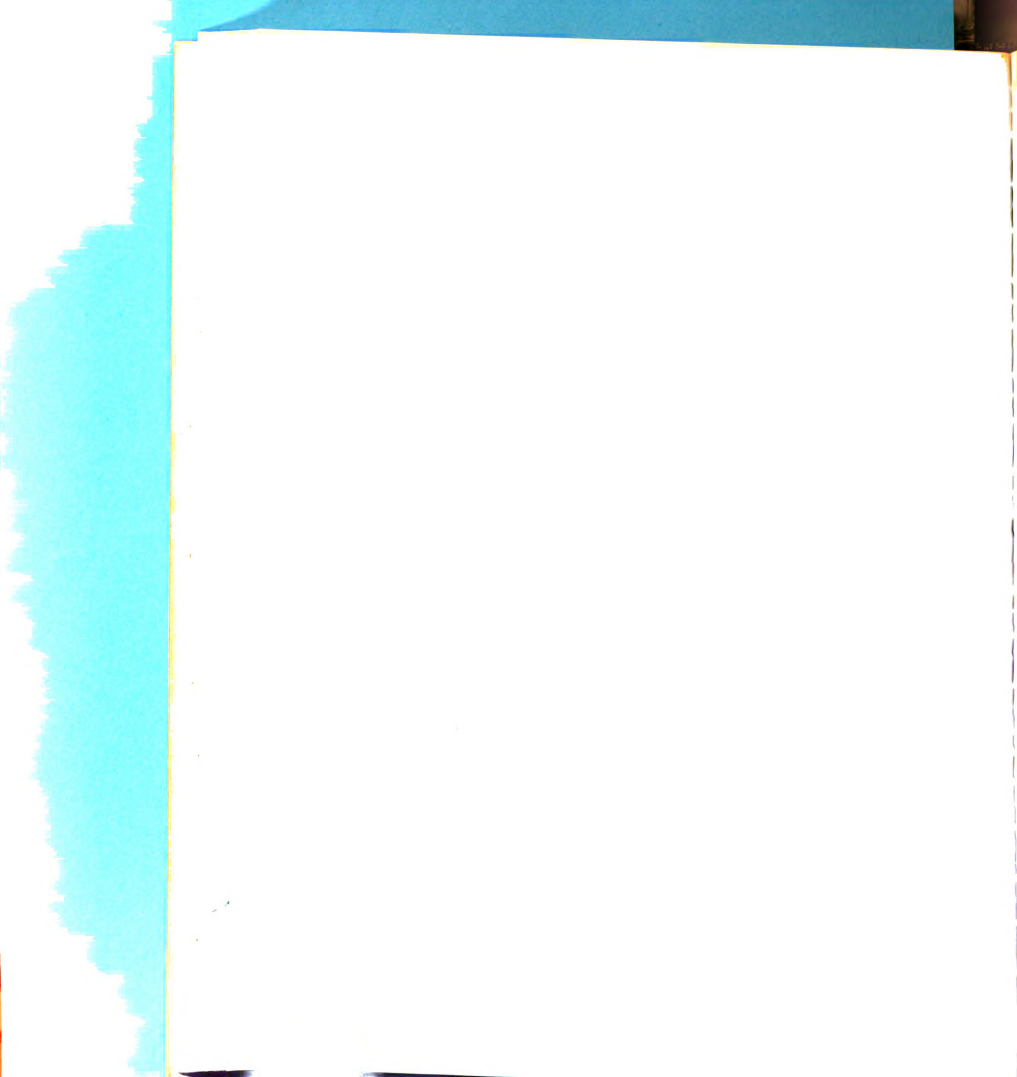
In a study of the American Negro, Green⁶ also found GSCI mean scores significantly higher for the Negro male and female students than the Caucasian counterparts. He hypothesized that:

"Perhaps Negro students have an awareness 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."

The above hypothesis may be equally appropriate in this study of the Indian. An explanation of why the Indian student responds positively to the GSCI and then responds differently in an actual academic setting may have been suggested by Havighurst⁷, "motivation for school achievement is poor because the culture of the Indian tribes is based on co-operation rather than competition." A large part of the sample studied had lived on reservations, but presently they were being educated away from the reservation in a white man's culture and by Caucasian teachers, largely. The Indian may have an awareness of the white man's value system, but in the school setting, there is still a great need to accede to his own non-competitive culture.

⁶Robert Lee Green, "The Predictive Efficiency and Factored Dimensions of the M-Scales for Eleventh Grade Negro Students, An Exploratory Study." Unpublished Doctoral Dissertation, Michigan State University, 1962.

⁷Robert J. Havighurst, op. cit.



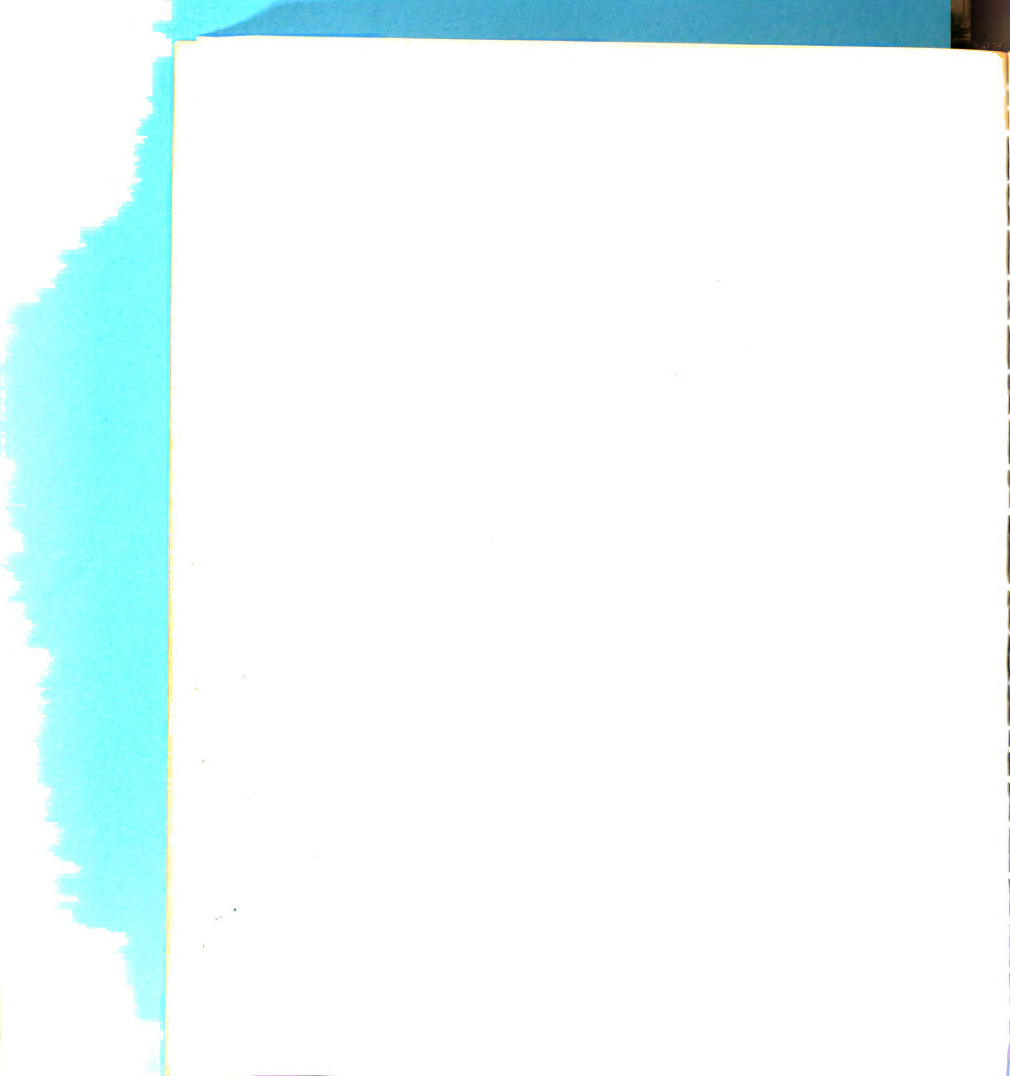
The exceedingly high drop out rate of Indian students makes it evident that when one appraises the Indian student by evaluating high school juniors, most of whom are over age for the grade, the researcher may be working with a biased sample that is actually more highly motivated academically than the Indian students who have left school before attaining this high a level of education.

The above observations and generalizations would cause the researcher to believe that replication of the study is warranted for more objective conclusions.

Factor Analysis

The hypothesis that the 22 variable factor analysis for the Indian males will yield a factorial structure different from that derived for the Caucasians was not supported by the results of this study. Five factors: 1) chance taking versus no chance taking, 2) n-academic achievement, 3) intrinsicness versus extrinsicness, 4) speed versus thoroughness, and 5) situational involvement were held in common by both groups; however, two more factors: 1) competitiveness versus non-competitiveness, and 2) unique accomplishment versus common accomplishment were derived for the Indian male.

Factor I for the Indian sample pertained to intrinsic versus extrinsic values; items 66 and 77 loaded highest on the factor for both the Indians and Caucasians. Item 46, the unique item, may best be described as a thought versus action item.



Three items (11, 55, and 59) loaded highest on Factor II for both groups; item 11, which is unique to the Indian sample, also appears to be appropriate for this n-academic achievement factor.

Speed versus thoroughness characterizes Factor III; two items (20 and 33) are held in common by the Indian and Caucasian factors. Item 44 registered almost an equivalent loading on the n-academic achievement factor which this item may fit more appropriately.

The three items (13, 38, and 39) cause Factor IV to be characterized as a chance taking versus no chance taking factor; two of the items (13 and 39) also loaded highest on this factor in the Caucasian sample.

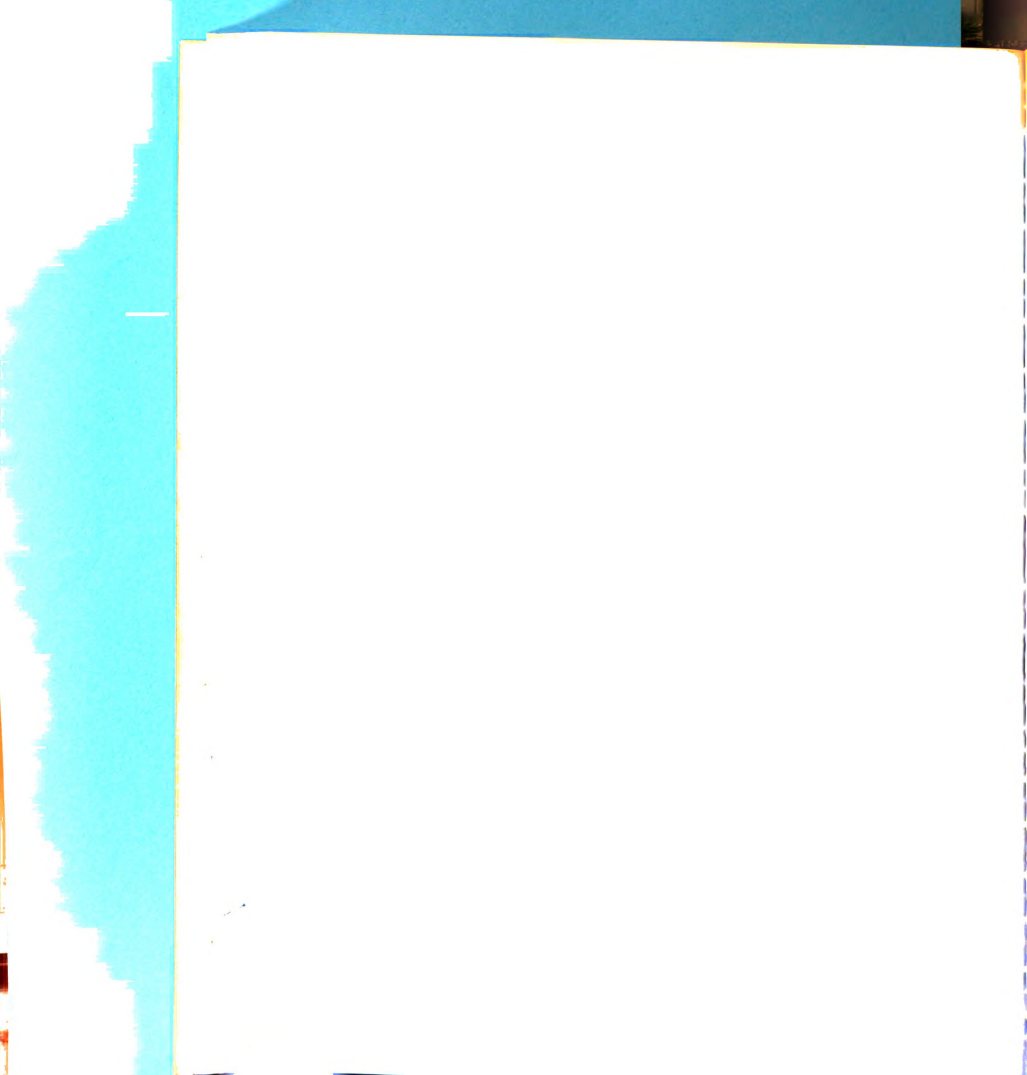
Factor V, situational involvement, contained three items (9, 16, and 23) that loaded highest on the same factor in the Caucasian study; item 50, which loaded heaviest of all items, appears appropriate for this factor.

Items 41 and 36 loaded heaviest on Factor VI. Havighurst suggested that the inability of the Indian to achieve at a high level academically may be due to the non-competitive culture influencing him.⁸ Item 41, and to a lesser degree item 36, justifies this factor being characterized as a competitive versus non-competitive factor. Factor VI is unique to the Indian sample.

Factor VII is characterized as unique versus common accomplishment; it is comprised of two items (6 and 15) which loaded highest on this factor. Item 15, which loaded $-.803$, suggests the name of the factor.

A study of the two analyses reveals a similarity in the factors pertaining to academic motivation for the Caucasian and Indian males;

⁸Robert J. Havighurst, op. cit.



however, the factors characterized as competitiveness versus non-competitiveness and unique accomplishment versus common accomplishment appear to be unique to the motivational pattern of the Indian student.

The implications of the factor analysis are that the Indian students appear to have many of the same achievement motives that the Caucasians have; however, the factorial structure does differ for the two groups and there are factors unique to the Indian sample that may explain the difference in achievement of the two compared samples. The differences in achievement found in this study have been supported by several former studies; similarly, the differences in academic aptitude, when measured by a verbal test, have been indicated in other studies. This study indicated that only about 16% of the variance was accounted for when predicting achievement with a verbal aptitude test. This implied a necessity for research to understand the variance unaccounted for.

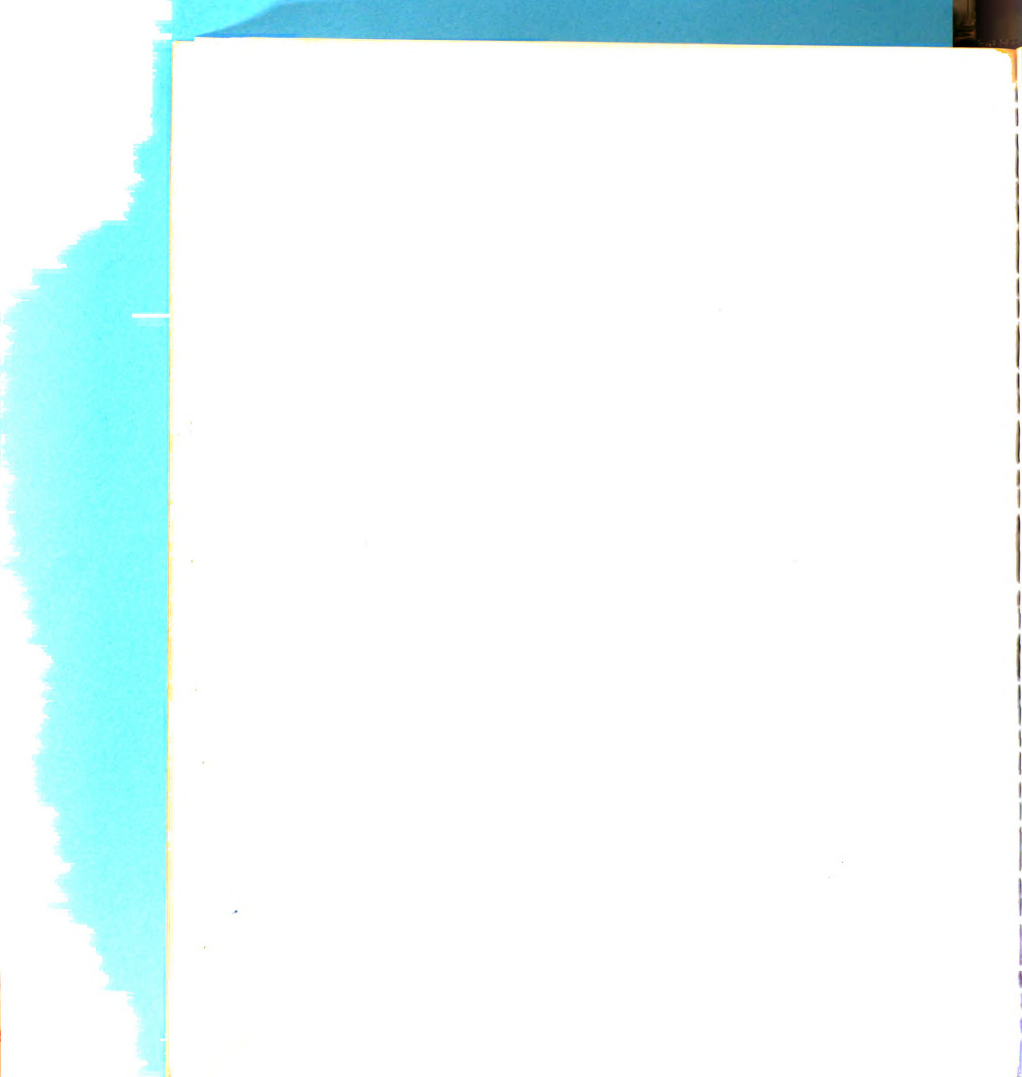
As a predictor of achievement, the aptitude test (DAT-VR) proved to be statistically significant and the M-Scales also proved to be significant as a predictor of achievement; however, only about 27% of the variance has been accounted for when the combination of the aptitude measure and the M-Scales is used.

Because of the Indians' cultural background and ineptness to work with the English language, perhaps a motivation study utilizing depth interviews, rather than the paper and pencil group test method used in this study, would provide more reliable and meaningful data.



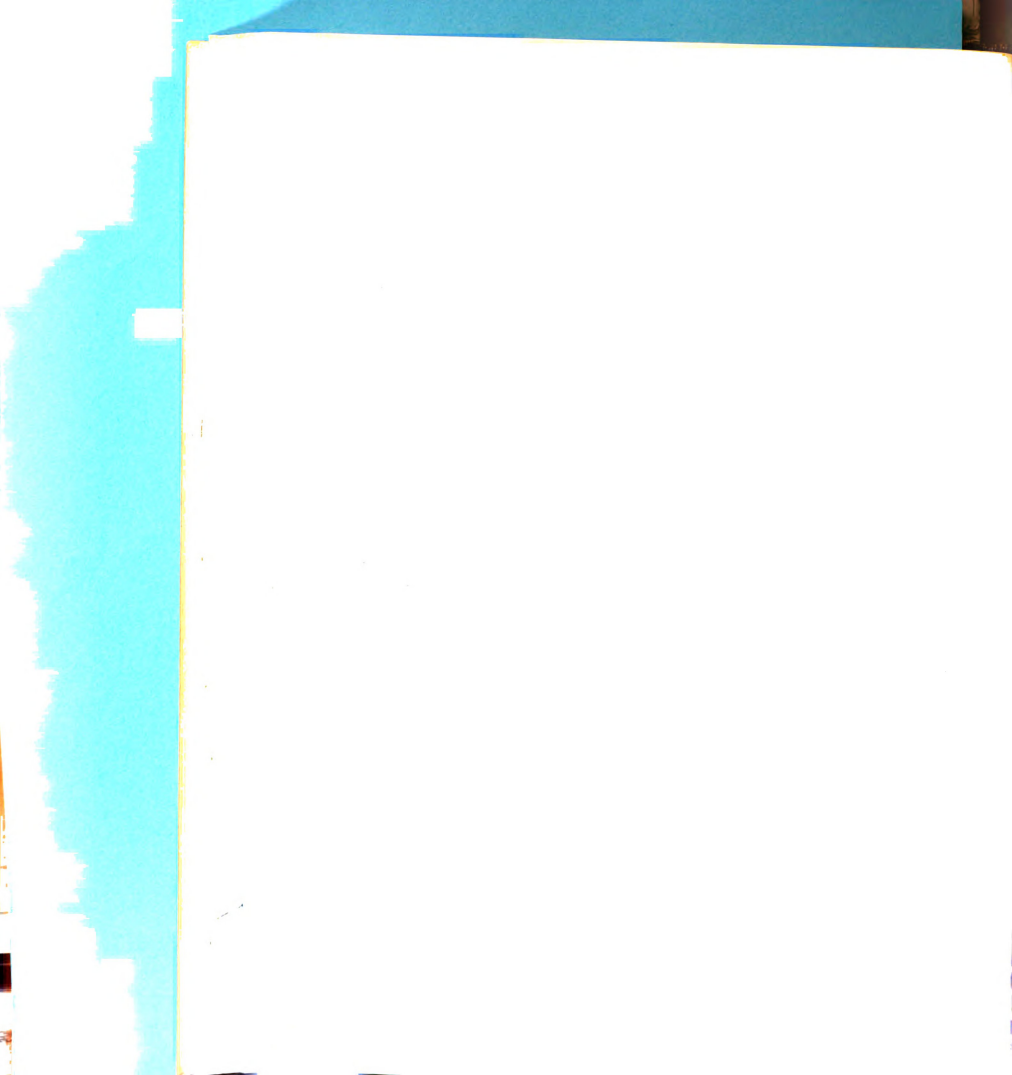
RECOMMENDATIONS

1. Replication of the study with a smaller sample, but using depth interviews rather than the group test method used in this study.
2. Replication of the study on another sample of Indian students to ascertain whether or not the same academic and motivational differences prevail.
3. Replication of the study in schools where the Indian student is a minority in a Caucasian environment. Differences in teacher values relative to achievement and motivation may exist.
4. Replication of the study in other geographic areas of the United States.
5. All sub-tests of the M-Scales should be factor analyzed to gain knowledge of the effectiveness of the entire test as it relates to the Indian population.



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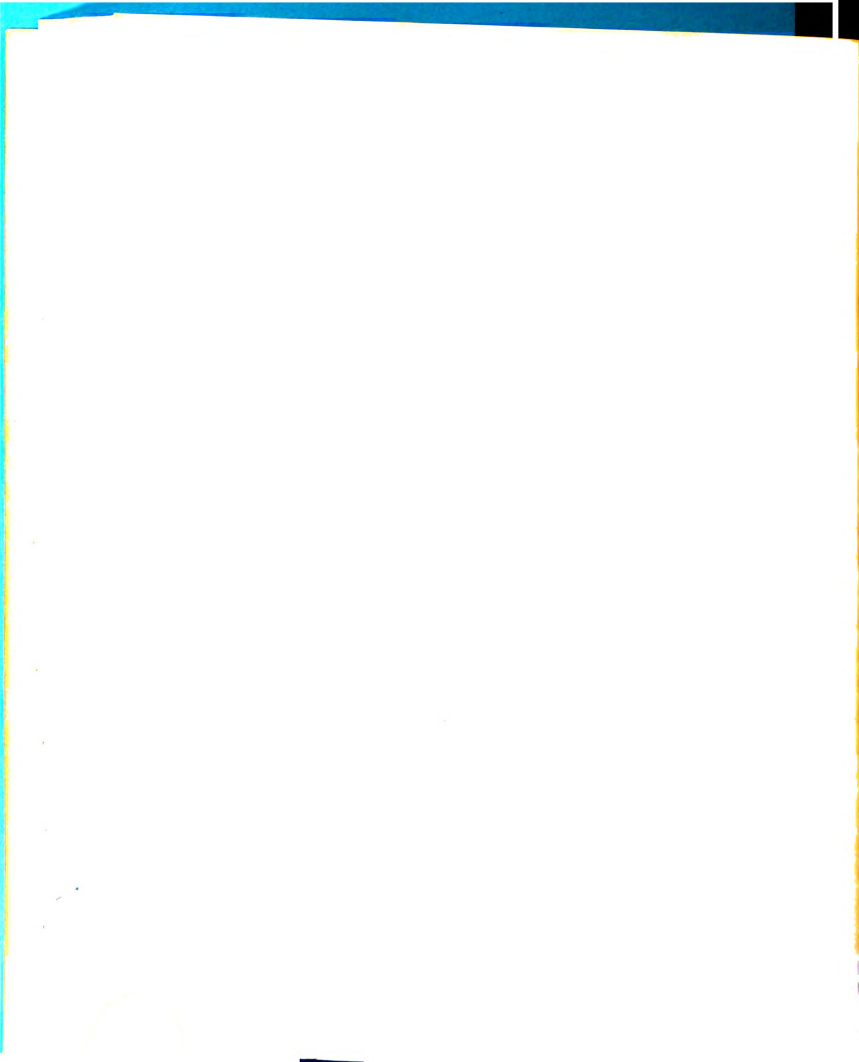
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APPENDIX A

Intercorrelation Matrix, Unrotated Factors,
Rotated Factors, and Highest Factor Loadings
for Twenty-Two Item Factor Analysis of the
GSCI Based on Indian Males.

Rounded Intercorrelation Matrix for Twenty-Two Significant Items--GSCI Indian Males
(Values are positive unless otherwise indicated, and the decimals are omitted)

Item	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	1																						
2	160	1																					
3	070	282	1																				
4	-157	055	094	1																			
5	-148	-010	065	068	1																		
6	034	-123	020	-119	094	1																	
7	253	206	157	000	-100	-090	1																
8	035	179	205	036	-125	-062	035	1															
9	132	275	265	010	079	-081	132	107	1														
10	053	159	255	011	-073	-116	330	246	211	1													
11	-103	-092	152	210	-134	087	044	385	-076	164	1												
12	070	236	175	042	-030	020	-017	306	140	-020	152	1											
13	-044	031	035	420	-006	-079	015	183	092	040	059	093	1										
14	-024	050	019	115	031	-089	-024	100	142	157	032	210	289	1									
15	181	147	230	-011	056	026	093	126	112	180	006	274	006	068	1								
16	092	310	355	123	010	075	149	229	118	022	351	184	199	025	025	1							
17	053	227	160	106	-339	-017	053	145	089	-055	183	104	-116	018	-069	238	1						
18	037	-180	039	-039	073	244	-127	-051	-112	-003	104	039	-005	-063	031	-120	-124	1					
19	053	159	347	121	027	081	192	139	167	223	164	026	164	056	087	262	063	-089	1				
20	069	095	373	109	-109	201	297	-032	144	207	031	009	275	150	101	250	052	-009	495	1			
21	105	-273	-042	250	046	-030	-105	145	007	007	140	236	140	229	-042	036	204	170	-066	-073	1		
22	020	194	213	070	226	061	-128	-072	199	054	026	115	092	086	057	202	182	029	260	194	281	1	



Eight Unrotated Factors for Twenty-Two Items of the GSCI Selected on the Basis of Sums of Squares Above 1.00 for Indian Males. (Values are positive unless otherwise indicated; decimals are omitted.)

Item Number	Factors								Communality *
	1	2	3	4	5	6	7	8	
1 (6)	20	-32	-19	09	32	-10	53	-16	61
2 (9)	50	-25	-20	-17	28	29	-17	-13	60
3 (11)	64	-17	14	20	08	01	-22	11	57
4 (13)	28	47	14	-29	-33	10	01	-06	53
5 (14)	-06	10	59	-13	35	03	-42	08	68
6 (16)	-02	03	35	64	07	-07	13	-23	61
7 (18)	35	-53	-11	-11	-21	-14	24	03	55
8 (20)	45	23	-44	05	-03	-34	-28	01	65
9 (23)	44	-20	05	-28	30	10	-04	17	45
10 (27)	43	-25	-04	-15	-12	-45	-02	55	79
11 (33)	34	43	-23	41	-31	-20	-22	17	73
12 (36)	39	29	-23	02	46	-18	-07	-34	65
13 (38)	35	36	26	-39	-31	-13	14	-36	73
14 (39)	28	30	07	-44	07	-19	22	-03	46
15 (41)	30	-17	03	00	40	-42	-11	-21	51
16 (44)	59	09	-05	25	-11	27	-19	-26	61
17 (46)	32	14	-47	22	-01	51	23	15	73
18 (50)	-12	24	26	42	20	-39	23	16	59
19 (55)	58	-17	33	14	-26	-06	-02	07	57
20 (59)	55	-23	42	12	-32	-01	30	-13	76
21 (66)	17	62	-06	-06	27	01	42	26	73
22 (77)	38	20	38	06	35	41	08	29	71
Sum of Squares	3.33	1.98	1.71	1.56	1.54	1.42	1.23	1.06	



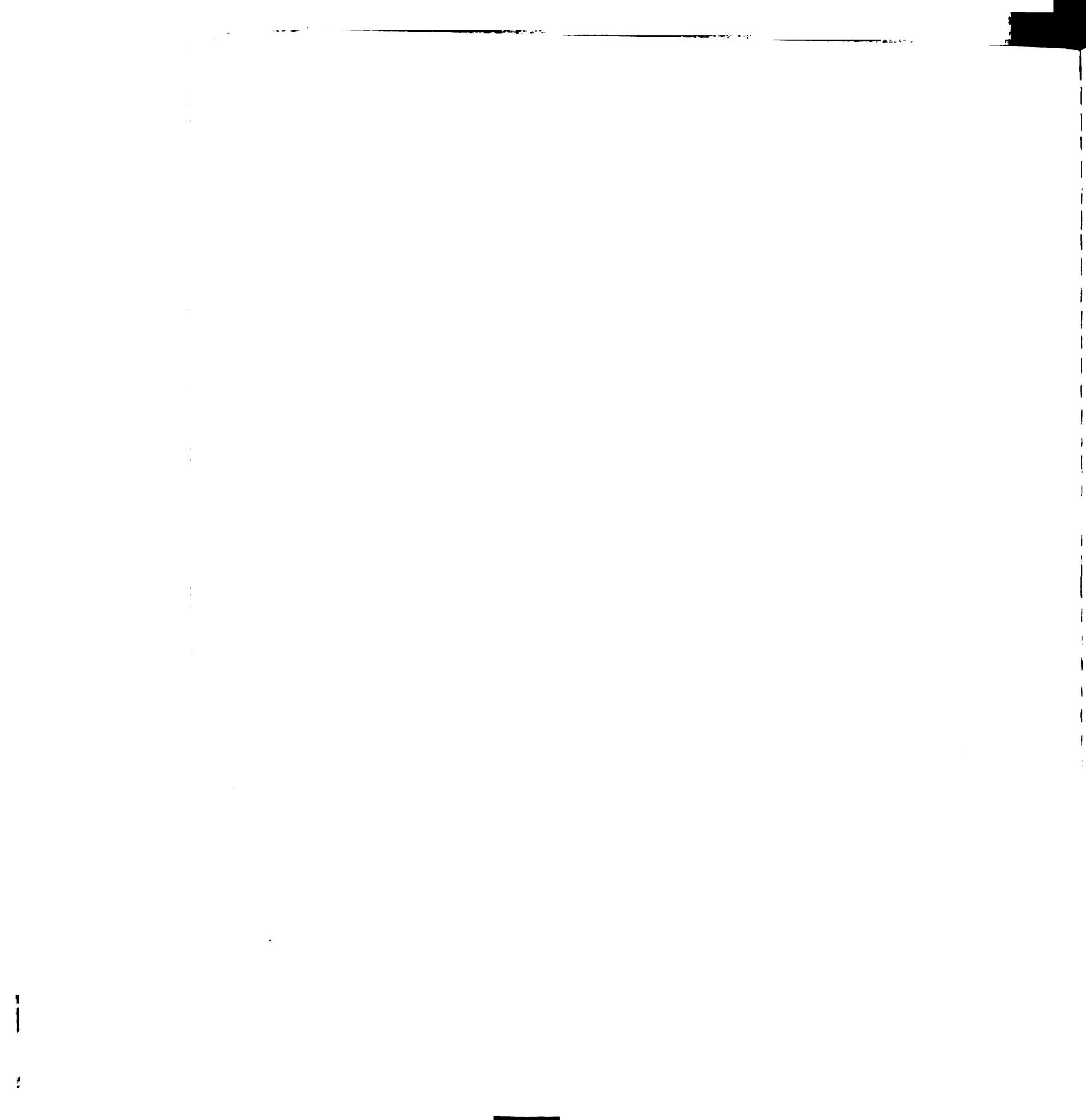
Rotated Factors for Twenty-Two Selected Items of the GSCI for Indian Males
(Values are positive unless otherwise indicated; decimals are omitted.)

Item Number		Factors							
		1	2	3	4	5	6	7	8
1	(6)	143	-160	265	149	-080	-446	486	-157
2	(9)	128	-271	-087	151	559	-297	013	-277
3	(11)	109	-583	-294	142	128	-247	-168	039
4	(13)	172	-106	-218	-603	116	229	-086	-046
5	(14)	074	-020	154	002	-040	-069	-803	-054
6	(16)	-008	-263	-066	215	-652	018	-056	-263
7	(18)	-201	-442	163	-015	216	-206	394	200
8	(20)	-029	028	-670	-119	151	-369	106	133
9	(23)	248	-280	117	019	401	-326	-142	054
10	(27)	002	-330	-079	-078	169	-349	034	718
11	(33)	073	-088	-794	-070	-181	066	068	225
12	(36)	198	092	-357	-112	023	-571	-001	-374
13	(38)	-021	-204	-074	-806	012	-014	-024	-193
14	(39)	240	006	060	-569	089	-267	-001	029
15	(41)	-120	-128	-049	020	-049	-676	-114	-100
16	(44)	090	-453	-500	006	158	019	032	-354
17	(46)	502	-097	-307	219	255	201	457	-123
18	(50)	192	042	-019	050	-688	-171	-083	178
19	(55)	027	-725	-137	-090	035	030	-077	068
20	(59)	-019	-805	077	-237	-142	007	133	-050
21	(66)	744	200	-094	-300	-164	-109	106	073
22	(77)	689	-335	048	065	043	027	-331	-092

Highest Factor Loadings for Twenty-Two Selected Items of the GSCI for Indian Males
(Values are positive unless otherwise indicated; decimals are omitted.)

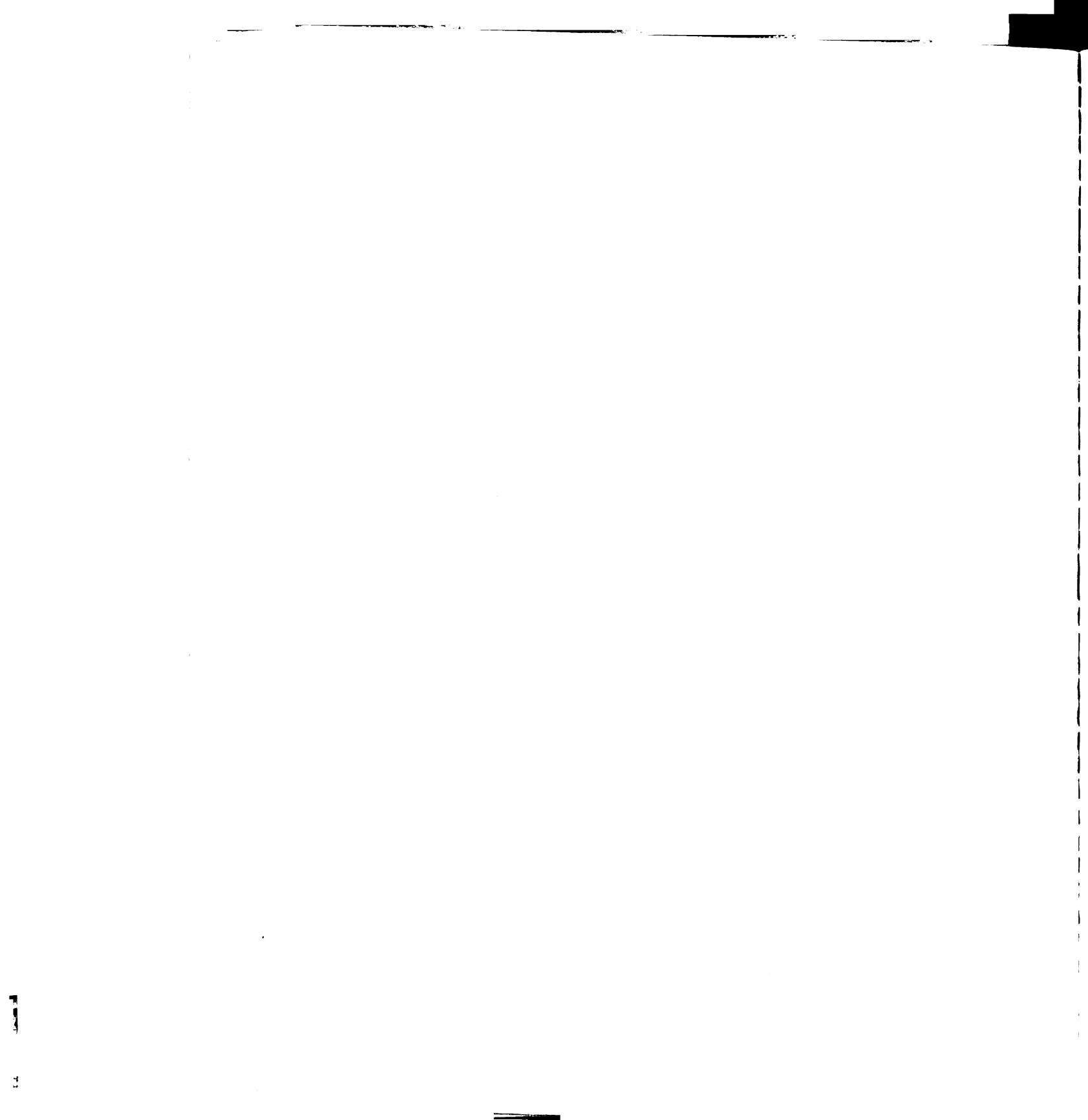
Item Number	Factors							
	1	2	3	4	5	6	7	8*
1 (6)							486	
2 (9)					559			
3 (11)		-583						
4 (13)				-603				
5 (14)							-803	
6 (16)					-652			
7 (18)		-442						
8 (20)			-670					
9 (23)					401			718
10 (27)			-794			-571		
11 (33)								
12 (36)								
13 (38)				-806				
14 (39)				-569				
15 (41)						-676		
16 (44)			-500					
17 (46)	502							
18 (50)					-688			
19 (55)		-725						
20 (59)		-805						
21 (66)	744							
22 (77)	689							

* Not interpreted as a significant factor because only one item was loaded highest on it.



APPENDIX B

Sample Items From the
Michigan State M-Scales



Generalized Situational Choice Inventory

I would prefer to:

- 46. 1) Think of an idea that nobody has ever thought of, or
2) Set a world's speed record
- 47. 1) Perform well in class, or
2) Watch television
- 48. 1) Learn by defeating an inexperienced player, or
2) Learn by defeating an expert
- 49. 1) Save enough money to buy something with cash, or
2) Buy something on credit and pay for it as I use it
- 50. 1) Do what I think is right, or
2) Do what others think is right

Preferred Job Characteristics Scale

I would prefer:

- 81. 1) A job where my opinion is valued
2) A job with short working hours
- 82. 1) A job where I solve problems no one else can
2) A job which permits me to take days off when I want
- 83. 1) A job which does not require a college education
2) A job where I can decide how the work is to be done
- 84. 1) A job which pays well and requires little effort
2) A job where I could express my ideas, talents, and skills
- 85. 1) A job which requires little thinking
2) A job where I could continue to learn the rest of my life



Work Rating List

Teachers feel that I am:

	<i>Never</i>	<i>Sometimes</i>	<i>Usually</i>	<i>Always</i>
144. purposeful	1	2	3	4
145. uninterested	1	2	3	4
146. a procrastinator	1	2	3	4
147. unreliable	1	2	3	4
148. studious	1	2	3	4

Human Trait Inventory

	<i>Never</i>	<i>Sometimes</i>	<i>Usually</i>	<i>Always</i>
212. I like collecting flowers or growing house plants.	1	2	3	4
213. I worry about my grades.	1	2	3	4
214. Many times I become so excited I find it hard to go to sleep	1	2	3	4
215. I daydream frequently.	1	2	3	4
216. I work things out for myself rather than have a friend show me how.	1	2	3	4

Work Rating List

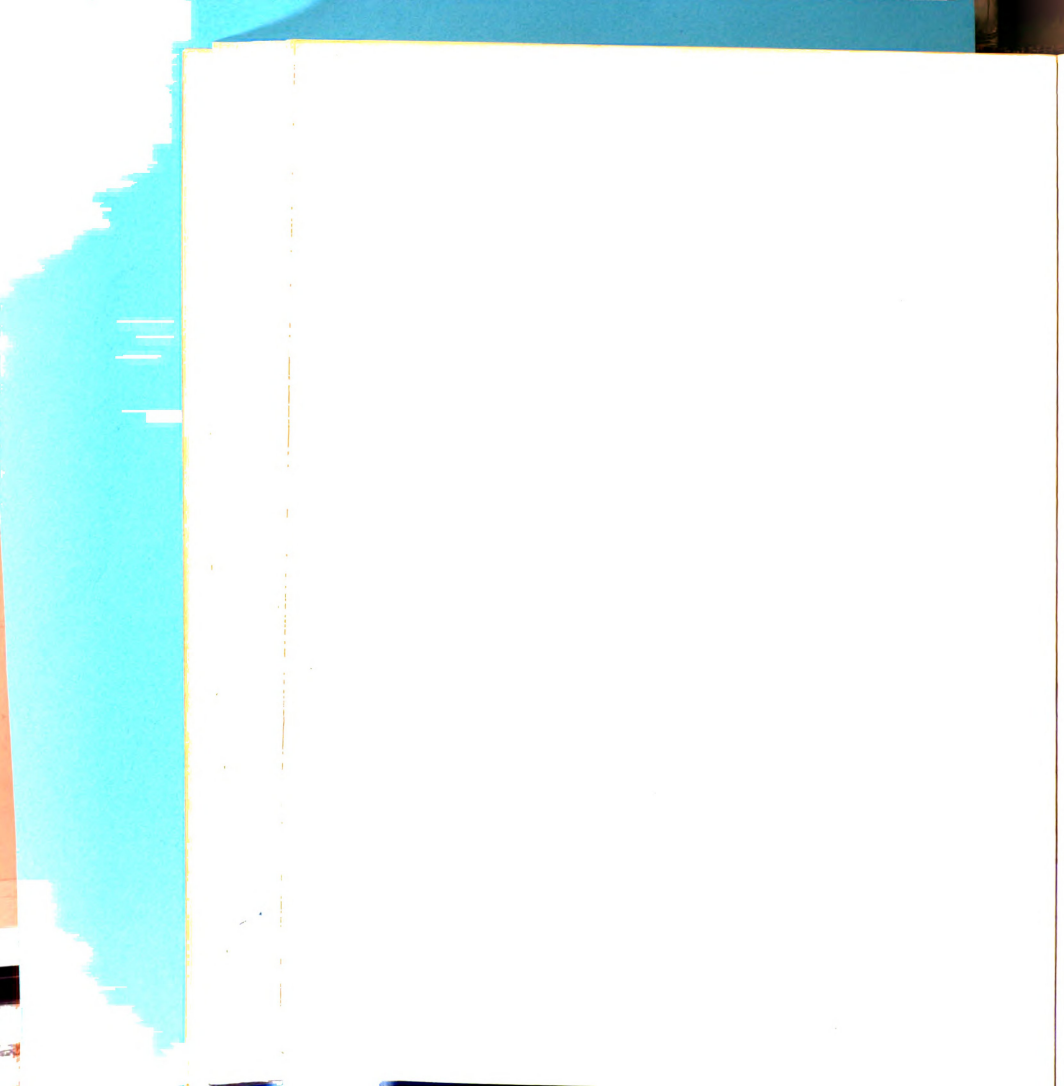
Teachers feel that I am:

	<i>Never</i>	<i>Sometimes</i>	<i>Usually</i>	<i>Always</i>
144. purposeful	1	2	3	4
145. uninterested	1	2	3	4
146. a procrastinator	1	2	3	4
147. unreliable	1	2	3	4
148. studious	1	2	3	4

Human Trait Inventory

	<i>Never</i>	<i>Sometimes</i>	<i>Usually</i>	<i>Always</i>
212. I like collecting flowers or growing house plants.	1	2	3	4
213. I worry about my grades.	1	2	3	4
214. Many times I become so excited I find it hard to go to sleep	1	2	3	4
215. I daydream frequently.	1	2	3	4
216. I work things out for myself rather than have a friend show me how.	1	2	3	4





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