A STUDY OF

THE RELATIONSHIP OF SOCIO-ECONOMIC STATUS AND

INTELLIGENCE AND ACHIEVEMENT SCORES

OF WHITE AND NEGRO GROUPS

By

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TABLE OF CONTENTS

Chapter		Page
I.	INTRODUCTION	1
	The Nature of the Problem	1
	Definitions of Terms	3
	Operational Definitions of Intelligence and Achievement	6
	Need for the Study	6
II.	REVIEW OF THE LITERATURE	9
	Army Studies of Negro and White Groups on Ability Variables	9
	The Hereditarians--Shuey--Garrett--McGurk	14
	The Environmentalists Reply	16
	The Dreger-Miller Review and Its Implications	20
	Socio-Economic Status and Intelligence	20
	Matched Group Comparisons	22
	The Range of Negro Intelligence	24
	Regional Variations and Social Class	25
	Comparative Achievement Levels of White and Negro Groups	25
	Achievement Studies	27
	Summary of the Review of the Literature	31
	The Limits of the Study	33
	Statement of the Hypotheses	33
III.	DESIGN AND METHODOLOGY	35
	Subjects	35
	Instruments	36
	The Two-Factor Index of Social Position	39
	Statistical Treatment	40
IV.	PRESENTATION AND ANALYSIS OF THE DATA	42
	Introduction	42
	Analysis of Variance	42
	Two-Way Classification of the Analysis of Variance for the Henmon-Nelson Test	49
	Two-Way Classification of the Analysis of Variance for the ACT Test Battery	56
	Analysis of Covariance	65
	Testing the Hypotheses	74

Chapter Page

V. CONCLUSIONS 78

Summary and Discussion of the Findings 78
Recommendations 81

A SELECTED BIBLIOGRAPHY 83

APPENDIX A 94

APPENDIX B 106

LIST OF TABLES

Table		Page
I.	Analysis of Variance for Ability Variable for Selected White and Negro Groups	44
II.	Analysis of Variance Means for Table I	45
III.	Analysis of Variance for Achievement Variables for Selected Negro and White Groups	47
IV.	Analysis of Variance Means for Table III ACT Means for Selected Negro and White Groups	48
V.	Stratified Analysis of Variance for the Henmon-Nelson Test for Socio-Status Index Groups I, II, and III	50
VI.	Means and Critical Ratios for Total Score - Henmon-Nelson	51
VII.	Means and Critical Ratios for the Quantitative Score Henmon-Nelson	53
VIII.	Means and Critical Ratios for Verbal Score - Henmon-Nelson	55
IX.	Stratified Analysis of Variance for the ACT Test Battery	57
X.	Means and Critical Ratios for the ACT Composite Score	58
XI.	Means and Critical Ratios for the ACT English Score	59
XII.	Means and Critical Ratios for the ACT Mathematics Score	61
XIII.	Means and Critical Ratios for ACT Social Science Scores	63
XIV.	Means and Critical Ratios for ACT Variable Natural Science	64
XV.	Analysis of Covariance for ACT Achievement Variables Socio-Status Index I	66
XVI.	Means for Covariate Analysis for Socio-Status Index I	67
XVII.	Analysis of Covariance for ACT Achievement Variables Socio-Status Index II	69

CHAPTER I

INTRODUCTION

The Nature of the Problem

The nature and the amount of Negro intelligence as compared with the nature and the amount of white intelligence has been the subject of controversy every since the Africans were brought as slaves to this country. Is intelligence an innate unchanging property, or is it a result of an organism interacting with his environment? Writers on personality theory such as Adler, Fromm, Horney, and Sullivan say that man's personality does not exist or reside in man alone but that it comes into being as man interacts with his environment. The correlation of intelligence and personality has proved to be rather high. Is it safe to say that, while there is a biogenic substrata of intelligence, it merely places man into the human family (except exceptional cases of genius and mentally defectives) while the sociogenic forces prove the measure of the man?

Moreover, what decides the kind of environment in which the person will be socialized? Our society differentially rewards individuals with money for tasks performed. Those who are in a position to get the larger rewards are also in a position to exploit their environment to a greater degree. The offspring of those high in the hierarchy of the

stratified society do not start at the bottom of the hierarchy; but rather, they start where their parents are.

The history of testing in the United States failed to take this into consideration when testing white and Negro groups. The writer joins an ever expanding group of social scientists who feel that tested differences between the two groups have nothing to do with either group in terms of native ability, but rather, that they are a description of the economic differences between the two groups as a whole. Testing as a science has now begun to mature. No longer is it claimed that Intelligence Quotients are the measure of innate ability. Neither is it claimed that Intelligence Quotients are stable for all individuals. In fact, recent studies show changes of up to 50 points.

In addition, the occupations of Negro and white groups reveal a difference only in numbers. In other words, Negroes and whites are engaged in virtually the same occupations with fewer Negroes showing up in the professions where prolonged education is an entrance factor. If some Negroes are able to perform acceptably the same task as members of the white race, the writer would conclude that both are intelligent enough to do the job. Hence, it is concluded that the proper use of intelligence and achievement tests would not lead to the conclusion that biogenic factors have operated to make one group more intelligent than the other group. The proper use of such tests should cause the user to seek sociogenic factors as the causative agents. The "true" educator would identify and control, where possible, those factors of ecology that might hinder the youth in achieving their potential.

Even those authors (McGurk, Garrett, and Shuey) who would ascribe biogenics as the source of difference would admit that from 28 to 32% of

the Negro samples surpass the mean of the white samples. If biogenics were a racial thing, how do they account for this group that surpasses the white mean? Are they as a group inferior to the white sample that falls below the mean? In a group of 22 million people, 28% is 6,160,000 people. Would these proponents of racial inheritance superiority be ready to certify this many people superior genetically to a large number of their supposedly superior people? Probably not. This may show the insincerity of their argument. For this reason, the present writer dismisses the biological argument as inconsequential, in the light of reality. Rather, the writer sees the importance of identifying and controlling those factors that may lead to the loss of human potential. The conservation of human resources becomes the raison d'etre for this study.

Definitions of Terms

The focus of this section is on the terms intelligence and achievement. A number of definitions are reviewed and the operational definitions are given. Of the two constructs, intelligence is the more difficult to obtain inter-experimenter agreement. The specificity of its morphology and its boundary limits are nebulous. However, this is not to infer that it does not have utilitarian properties that make it useful. The constructs are reviewed as they relate to testing rather than to their broader meanings in the common vernacular.

Test. Anastasi (4) defined a test by stating that "a psychological test is essentially an objective and standardized measure of a sample of behavior." Greene (50), on the limitations of tests, stated that "lastly mental tests ordinarily cannot show why a person made a particular score,

but only that he did make the score. This is true of all measures of behavior."

Intelligence Definitions Reviewed. As early as 1928, Dearborn (25) compiled a list of the definitions of intelligence then in use. He reported:

> In a recent symposia on the subject held by British and American psychologists, many and varied opinions were expressed. Some of the briefer statements or definitions, beginning with one of Binet's, are: (1) "Intelligence is judgement, or common sense, initiative, the ability to adapt one's self." (2) According to Burt: "Voluntary attention is the essential factor of general intelligence." (3) Terman says: "Intelligence is the ability to think in terms of abstract ideas." (4) "Intelligence is intellect plus knowledge," according to Henmon. (5) "Intelligence is an acquiring capacity," says Woodrow. (6) One of the best definitions is proposed by Ballard: "Intelligence is the relative general efficiency of minds measured under similar conditions of knowledge, interest and habituation." Other definitions are: (7) "Intelligence is a composite measure of abilities to learn" (Gates) and one proposed by Thorndike, (8) "We may then define intellect in general as the power of good responses from the point of view of truth or fact."

Stoddard (128) defined intelligence as follows:

> Intelligence is the ability to undertake activities that are characterized by (1) difficulty, (2) complexity, (3) abstractness, (4) economy, (5) adaptiveness to a goal, (6) social value, and (7) the emergence of originals, and to maintain such activities under conditions that demand a concentration of energy and a resistance to emotional forces.

Stoddard (128) refined his definition as follows:

> The rough and ready doer of every task as it comes is by this alone no highly intelligent human being, nor is a well-read library worm the most intellectual of human beings. He must be tested in a tougher world. The content of any genuine intelligence test will screen them both out. Teachers generally have been sensitive to the low intellectual rating of the manual laborer, the craftsman, and the doer of tasks, and have gone too far. With respct to the bookworm, the knower-of-facts, the reciter-of-ideas, they have been too lenient. They have kept him long and mistakenly within high-ranking intellectual circles. The man of good health, good deeds, and good emotions may rank intellectually low, while in a culture viewed as a whole, he becomes important. The honest worker, good companion, and social contributor has the heart and enough of the intellect. It is the pseudo intellect, frequently lacking in these solid virtues, who regards himself as at least higher on the intellectual side.

Hunt (65) cited three sources of evidence which are dissonant with the fixed intelligence idea. " . . . (1) from the studies of identical twins reared apart, (2) from repeated testing of the same children in longitudinal studies, and (3) from studies of the effects of training." In each of the above mentioned situations, the IQs of the children changed more than could have been expected if the theory of fixed intelligence were true.

Wechsler (140) reviewed the early history of intelligence and then defined it as follows: "Intelligence, operationally defined, is the aggregate or global capacity of the individual to act purposefully."

Achievement Definitions Reviewed. Inter-observer agreement is easier to be obtained for the construct achievement than for intelligence because it deals with overt measurable behavior. The genesis of the construct as a norm in the society is found in the rise of capitalism. Achievement, as it relates to test behavior, is defined by Garrett (44), who stated:

> The purpose of the educational achievement test--like that of the ordinary school examination--is to discover how much a pupil knows about the subjects he has studied or is studying. Both the general intelligence test and the educational achievement examination measure aptitude for school work ("abstract intelligence"). The difference between the two is one of emphasis rather than of purpose. The intelligence test, as we have seen, tries to gauge mental alertness apart from specific school knowledge--that is it is concerned primarily with the efficiency of mental processes as exhibited in problems which demand learning ability, perceptual keenness, memory, reasoning, and the like. The educational achievement test is also concerned with mental processes, but only insofar as they are demonstrated in a student's performance in English composition, arithmetic, history, or science. The distinction between the two sorts of tests is not always clean-cut, and there is much overlap in content and in abilities called upon. All intelligence tests depend in some degree on previous learning and all educational tests depend in some part on native keenness. /italics in original/

Chauncey and Dobbin (16) asked:

What are achievement tests? Primarily they are jobs devised to permit the student to demonstrate what he can do with the information, skills, and ideas he is supposed to have learned in school. . . . the achievement test ordinarily measures knowledge and specialized intellectual skills learned over a shorter period of time--a month, a semester, a year or two--and taught directly in school.

Operational Definitions of Intelligence and Achievement

In this study intelligence is defined as the relative general efficiency of minds measured under similar conditions by the Henmon-Nelson Test of Mental Ability.

Achievement in this study is declared to be a sample of the knowledge of English, Mathematics, Social Science, and Natural Science as measured by the ACT test battery.

Need for the Study

Much of the earlier work done on racial differences was descriptive in nature. It described the mean differences found in the two populations. Some writers took these studies and ascribed to the measured differences innate or biological differences. The consequences in social practice for those declared biologically inferior were disastrous. School boards may have used such comments for the allocation of pupil finance. Teachers are reported to have used such information in their attitudes toward children in the classroom. Industry was, no doubt, influenced by this knowledge and preferred not to hire inferior people.

The socio-economic status of a family may well determine in part the intelligence and achievement level of an individual. Socio-economic

status probably determines the attitude of the parents toward the child. If the family is financially secure, the child may be loved and looked upon as an object of worth. Since our attitudes toward ourselves are derived from the attitudes of others toward us, such a child may be secure and sense himself as worthwhile. This is the basis for competency development. A child that comes into a home where there is financial insecurity is viewed as a threat to the security of those already there. He is another being with which to share an already inadequate amount of maintenance resources. He is brought into a culture that stresses individual achievement. With inadequate resources and a lack of a sense of personal worth, he has several strikes against him. The socio-economic status of his family may determine in part the child-rearing practices to which he will be subjected. Child-rearing practices build into the internal latent structure the positive and negative valences which determine the behavioral predispositions included in the intelligence and achievement syndrome. Children of parents from the lower socio-economic group may even develop antagonistic social habits. In addition, the out-of-school experiences which build self-confidence; such as, music lessons, vacations, elegant clothes, concerts, dinner guest, hobbies, and respect of the society at large are the experiences of the higher socio-economic class and are to him remote.

Subjects designated as Negroes in this study were determined to be Negroes by the sociological method rather than by the biological method. This is to say that those who classified themselves as Negroes were thus determined to be Negroes. The problem of determining biologically who is a Negro is a complex problem and beyond the scope of this study. It may

CHAPTER II

REVIEW OF THE LITERATURE

Army Studies of Negro and White Groups on Ability Variables

Intelligence testing, started by Binet and Simon in France, got its start in the United States under Terman at Stanford. Terman revised Binet's test in 1916. Otis, who was a graduate student under Terman, worked on a group variation of the now Stanford-Binet Test. Otis' work culminated in the Army Alpha and Beta Tests. These tests were widely used by the Army in both World Wars and much of the controversy about the intelligence of white and Negro groups stems from the Army studies.

All the Army studies were descriptive studies. They described the two test populations as they existed. The mean scores of the two groups showed the Negro recruits as being lower in intelligence achievement. Some political activist immediately subscribed innate factors as reasons for the statistical difference. However, recent investigators reviewing the test findings of the Army have raised some questions about the Army samples, test procedures, and the conclusions drawn from the Army testing. Eli Ginzberg and his staff have made an extensive study of the Army data from World War II. Ginzberg et al (46) reported:

During the war the Army accepted Negroes for enlistment or induction in numbers almost identically proportionate to their ratio in the population. In this process many more Negroes than whites were examined--the respective rejection rates were 47 percent and 27 percent, which reflected primarily the much higher proportion of Negroes who were unable to pass the educational screen. Almost one third of all Negroes were rejected essentially on educational grounds while the corresponding figure for whites was under 10 percent.

Ginzberg (46) further reported: ". . . that three fourths of all nonwhites liable for military service during World War II had only a grammar school education or less--compared to one third of the whites (white only)." /parentheses in original/ Further, Ginzberg et al reported: "A personnel survey in mid-1944 revealed that the proportion of Negro enlisted men with only a grammar school education was twice that of white soldiers--54 percent compared to 26 percent."

Ginzberg's group studied those soldiers who were considered ineffective. They reported this study in a volume entitled The Ineffective Soldier (47).

The findings appeared to confirm the widespread belief that Negroes make poor soldiers, but a careful review of the data made clear that a key factor responsible was the inadequate educational background of most Negroes. It was not the color of his skin or his disposition that made him a poorer risk to the Army than a white man but rather his severe educational deprivation. . . . We had repeated evidence of the importance of the educational factor not only when we studied it separately but also while assessing occupational and racial determinants in performance.

Alper and Boring (2) of Harvard reported a study of the intelligence scores of Northern and Southern whites and Negro recruits in 1918.

Everyone knows that Negro recruits in both World Wars have scored much lower on intelligence tests than have white recruits, whenever the more obvious parameters besides skin color are kept constant. The data from the First World War showed that northern Negroes did much better on the tests than southern Negroes. Anastasi printed results for the Negro recruits on both the Alpha and Beta examinations, making it clear that Negroes in the North do better than Negroes in the South, but saying nothing about the comparison of the northern Negro with the southern white. Klineberg gave the results for the Alpha examination only for the whites of four southern states and the Negroes of four northern states,

showing that the average score for the Negroes in each of these states was higher than the average for the whites in each of the southern states. . . .

Alper and Boring (2) further reported:

The primary results on the Alpha and Beta examinations for northern and southern white and Negro recruits in terms of Brown's Combined Score appear in Table I. They are what one might expect from what is already known. It was a disadvantage in the Army tests of 1918 for a white or a Negro to come from a southern state where education and economic opportunities are few instead of from a northern state where they are better, and also a disadvantage, whether northern or southern, to be Negro and not white. Thus the average score for the southern Negroes is lowest of the four because southern Negroes work against both these disadvantages, and the average score for the northern white is, conversely, highest of all. . . .

On a total of 26,894 men of both races Alper and Boring reported Analysis of Variance F tests of significance of 5,697; 2,953, and 146. The three F values are so much more significant than one chance in 1,000 of their being random that they lie nowhere near the entries of the published tables. Finally, Alper and Boring (2) reported:

. . . We thought that the inclusion of the Beta scores ought to give the Negroes some advantage that they did not have when Alpha scores were used alone. Beta was given to all men who scored low on Alpha, because they were either stupid or unable to read English. All illiterates, English speaking and non-English speaking, therefore took Beta. Its instructions were given in pantomime and it required no reading. It was obviously not culture-free, for some of the more difficult items depended on a good deal of sophistication. Our results show that these Negroes were not advantaged by Beta, relative to the whites.

. . . Our only suggestion in explanation of this fact is that Beta is less culture-free than even we had supposed, that Beta is better adapted to whites than to Negroes. Thus the 23 per cent of the southern whites that took Beta raised the average score for southern whites more than the 43 per cent of northern Negroes raised the average score for northern Negroes. Of course, it is possible to say that Beta overcomes illiteracy more than stupidity, and that the proportion of Negroes who went to Beta because of stupidity was greater than the proportion of whites who went for stupidity, a conclusion fully consistent with the common prejudice about the low level of Negro intelligence. We should not, however, wish to draw this conclusion in view of the fact that cultural differences are known to have such a large effect on test scores.

In the Ginzberg et al (47) study, it should be noted that while Ginzberg mentioned the unequal educational opportunities of the two races, and he pointed out that only 26 per cent of the Negro men had a grammar school education as compared to 54 per cent of the white men, Ginzberg did not mention that any attempt was made to control educational level and socio-economic level. In the Alper and Boring study, while mentioning that it was a disadvantage to be a Negro in the North as well as the South, no mention was made of any attempt to control educational level or socio-economic status.

Benedict and Weltfish (11) showed that Negroes from four selected Northern states scored higher than whites from four selected Southern states. Garrett (45), commenting on the findings of Benedict and Weltfish, stated that:

> While it is true that the Negro averages of New York, Ohio, Illinois, and Pennsylvania exceeded the white averages of Georgia, Arkansas, Kentucky, and Mississippi, they only overlapped whites of their own states by about 28 per cent.

Oelke (102) tested 684 Southern Negro veterans of World War II under the vocational guidance program of the Veterans Administration. He concluded that a positive relationship existed between test performance of these Negro veterans and the level of education completed. He also concluded that the scores on the test tended to concentrate in such a way which reduced the ability of the test to distinguish individual differences. He reported: "Since this is true, the instruments mentioned here should be used with caution when making vocational decisions involving Negroes, and in all probability the same statement should be made of other tests as well."

The instruments used in the study were the Otis Beta, Otis Gamma, Scovill Classification Test, Part 1, Survey of Space Relations, Minnesota Test of Spatial Relations, Bennet Test of Mechanical Comprehension, Minnesota Mechanical Assembly Test, Set 2, Purdue Pegboard, and the Minnesota Clerical Test.

Witty (143) reported on a Special Training Unit in the Army in which Negro and white soldiers participated. This unit was set up to train functional illiterates in basic education. He said:

> Analysis of a 17 month period of special training experience (1 June, 1943, through 31 October, 1944) shows that 84.2 per cent of the whites who leave special training are assigned for regular training; and 15.8 per cent of the whites are discharged from the Army. Of the Negroes who leave special training, 87.1 per cent are assigned for regular training; and 12.9 per cent are discharged from the Army. . . .

These men had to achieve fourth-grade standards.

Ralph Erickson (36) retorted to Witty's report by saying:

> . . . The question here is whether there are more intelligent illiterates among Negroes than among whites. On the basis of opportunity, it would appear that more bright Negroes never learned to read and write than in the case of whites. At least the opposite would not be true.

Moreover, Erickson (36) concluded:

> It would appear, therefore, that Witty has placed an undue emphasis on Special Training Units results, and that, instead of having an important bearing, they have no bearing whatever on the question of the intelligence of the American Negro.

Witty (144) immediately replied to Erickson's comments by saying:

> . . . Throughout the entire period of special training, Negroes and whites displayed similar rates of progress in mastering the three R's. Moreover, when Negroes and whites were further equated by use of educational tests and placed in one of four levels, their progress within each of the levels was conspicuously similar.

Hunt (66) issued a note of caution concerning the use of military test scores. He reported that in actual practice the same selection standards were not applied to both groups.

> . . . The standards enforced for Negroes were more lenient than those for white recruits. Any comparison of military performance between these two racial groups thus becomes a biased comparison between a white group from which most of the cases of mental deficiency have been removed and a Negro group which has been allowed to retain a much higher proportion of mentally deficient members.

Hunt (66) further reported that one only has to check neuropsychiatric discharges of the two groups to see that this is so. Mental deficiency is not a service connected disease but is largely congenital. Therefore, he concluded that "any great incidence of mental deficiency found typical of a single racial group must represent a constant error in the induction center screening of that group."

From the foregoing studies one can see that the results have been varied and the question has generated a good deal of discussion. Two groups of behavioral scientists have arisen to contest the claims of each other--on the one hand the biological inheritance group and on the other hand the environmentalist.

The Hereditarians

Shuey--Garrett--McGurk

Shuey (120) chose to review over two hundred studies dealing with white-Negro intelligence testing, and she concluded that there were some native differences between Negroes and whites as determined by intelligence tests.

Henry Garrett, professor emeritus of Columbia University and now of the University of Virginia, was Shuey's mentor and has written numerous articles on the subject of Negro-white intelligence. Only two articles other than the previously mentioned one will be quoted here. In The

American Psychologist, Garrett (42) wrote, "It is often forgotten that the fact /italics in original/ of racial differences is so immediate and compelling to most people that the burden of proof is on those who claim equality--not the reverse." Writing in U.S. News and World Report, Garrett (43) stated:

> From what we know about race differences, the Negro has less of what I call abstract intelligence than the white man. He functions at a lower level when it comes to the sort of ability that creates a modern technical society. That is, he is not able to think in terms of symbols, words, numbers, formulas, diagrams.

Frank McGurk is the third hereditarian. McGurk (84) first made his position publicly known in the popular magazine U.S. News and World Report in 1956. McGurk stated that when Negroes are given the same social and economic opportunities as whites, and when these socio-economic factors are good, the test-score differences between Negroes and whites actually increase. He continued:

> Regardless of our emotional attachment to the school-desegregation problem, certain facts must be faced. First, as far as psychological-test performance is a measure of capacity for education, Negroes as a group do not possess as much of it as whites as a group. This has been demonstrated over and over.
>
> Next, we must realize that, since 1918, the vast improvements in the social and economic status of the Negro have not changed his relationship to the whites regarding capacity for education. This is not to say that this relationship cannot be changed; it merely says it has not been changed. . . .
>
> . . . There is something more important, more basic, to the race problem than differences in external opportunity.
>
> Lastly, it should be remembered that the studies described in this article are not a selection of studies intended to emphasize a point of view. They are the only studies that relate to the problem.

McGurk stated his thesis in three other articles. The first appeared in The Journal of Applied Psychology, Vol. 37, 1953 (87); the second article appeared in July of 1953 in The Journal of Abnormal and Social

Psychology, Vol. 48 (86); and the third article appeared in 1959 in the Harvard Educational Review (85).

The Environmentalists Reply

Dr. Tumin (136) objected to Shuey's conclusions as proof of innate inferiority of Negroes. In fact, his panel of experts concluded that:

> There is not sufficient evidence to justify the conclusion that there are native differences between the intelligence of whites and Negroes. The nature of intelligence tests is such that they are incapable of identifying genetic differences between any two groups.

It has long been known that Negroes and whites differ on the average, but with considerable overlap, in their performance on psychological tests. However, it is generally agreed today that these tests do not measure only innate intelligence; what they measure as well are the effects of opportunity to learn the kinds of items included in the tests, the motivation of the individual taking the test, the meaningfulness of the items for him, and his ability to perform in a test situation. In all these respects, the Negro in our society is disadvantaged in comparison with whites in otherwise similar environments. There is no reason, therefore, to suppose that the relatively small average differences in test scores reflect differences in innate intelligence. Unfortunately, no test of mental abilities has yet succeeded in controlling all the environmental variables that might influence its validity. These include things such as prenatal and postnatal care, child-rearing practices, the socio-economic level of the family and its intellectual interest, the emotional interaction of parents and children and of siblings with one another, the quality and length of schooling, the social and cultural impact of the community and the vocational opportunities it provides. When efforts are made to equate environments of Negro and white subjects more fully, differences in average I.Q. are lessened, as the environmental interpretation would lead us to expect.

This much Dr. Shuey acknowledges. But in reaching her conclusion that there are native differences between Negroes and whites, she relies upon two unscientific devices.

First, in her summaries she lumps together indiscriminately studies that incorporate serious efforts to control environment and others that make no such effort. None of the studies on which she reports has controlled all the environmental variables simultaneously. /italics in original/

Pettigrew (105), writing in the Journal of Negro Education and in his book The Profile of the Negro American (106), also criticized Shuey's review. He stated that she ignores the newer conceptions of intelligence and instead relies heavily upon the earlier less sophisticated investigations with over half of her references dated prior to World War II. She also concentrates on research performed in the South, with three-fourths of her studies on students coming from tightly segregated Southern and border communities.

One of the studies which Garrett used to support his contentions is the published thesis of Myrtle B. McGraw, entitled A Comparative Study of a Group of Southern White and Negro Infants. McGraw (88), in the American Psychologist, repudiated the use of her study that Negroes are innately inferior. She stated:

> It would be a blessing to our profession if authors could withdraw from circulation those publications which they themselves, for one reason or another, would like to recind. As yet there is no convenient machinery for doing so. Many of us are therefore forced to blush when we see our early publications in a list of references.
>
> Such has been my feeling ever since the publication of my PhD thesis (McGraw, 1931). In 1928-29, using the Buhler scale of infant tests, I made a comparative study of white and Negro infants in Tallahassee, Florida, where I was teaching at the time. On a simple empirical basis I was convinced that there was no significant difference in the development of the two groups, even though there was no possibility of controlling the many variables, such as socioeconomic status, etc. However, when the scores were tabulated my professor of statistics insisted that the deviations between the two groups were about of the same magnitude as those obtained in studies of white and Negro school children. He pointed out that personal impressions have no place in scientific investigations and that the statistical data should speak for itself. Thus, it was so stated. I never felt happy about that implied generalization. I have always cringed when I saw any reference to the study. Fortunately, it has not been widely circulated, so I had assumed it had found its just niche in oblivion.
>
> At the recent APA meetings in Philadelphia I learned from Otto Klineberg that my old thesis is being quoted by my former professor of statistics, Henry Garrett, as supporting evidence of innate racial

differences. I was mortified! I think it is not necessary for me to point out that the number of infants studied was too small to justify any such generalization. The Buhler tests in no way presage mental endowment, and in the twentieth century it would be impossible to find pure genetic strains of Negroes even in the deep South.

According to Garrett (42), the Society for the Psychological Study of Social Issues (SPSSI) issued the following statement as a reply to one of Garrett's articles:

> The evidence of a quarter of a century of research on this problem can readily be summarized. There are differences in intelligence when one compares a random sample of whites and Negroes. What is equally clear is that no evidence exists that leads to the conclusion that such differences are innate. Quite to the contrary, the evidence points overwhelmingly to the fact that when one compares Negroes and whites of comparable cultural and educational background, differences in intelligence diminish markedly. The more comparable the background of white and Negro groups, the less the difference in intelligence. There is no direct evidence that supports the view that there is an innate difference between members of different racial groups.

McCord and Demerath (83) chose to answer McGurk in the Harvard Educational Review in the spring of 1958. They cited the six basic studies quoted by McGurk as having serious inadequacies. They further reported that he consistently omitted figures indicating the proportion of whites who equaled or exceeded the average score. "One must remember," stated McCord and Demerath (83), "that the average is not the median; if one or two testees scored extremely high, the average score for the entire group would be raised several points."

In particular, they cited H. A. Tanser's (129) investigation of Canadian Negroes and whites which was reported by McGurk as evidence of innate inferiority. McGurk (87) reported that social and economic opportunities have always been equal for all Negroes and whites in this area, except for a few minor outbursts of oppression directed toward Negroes.

McCord and Demerath (83) stated that:

McGurk, in addition, totally omitted references to Tanser's own confession that the socio-economic status of Negroes in Kent County was then and had always been inferior to whites. We charge that such a critical omission could only be due to conscious biasing of the evidence. In other studies quoted by McGurk, McCord and Demerath found numerous uncontrolled variables. McGurk quoted himself, and they charged that he used an unvalidated instrument of his own in his studies.

Klineberg (73) suspected Tanser's study, and Mollie Smart (122) confirmed Klineberg's suspicion. Smart, a Canadian who grew up in Kent County, made the following observation in the American Psychologist:

> Klineberg's (1963) discussion of Negro-white differences in intelligence test performance prompts an overdue comment on the Tanser (1939) study which Klineberg questions. Tanser stated that Negroes in Kent County, Ontario, were on a level with whites in regard to every social and political advantage. He found Negroes' IQs, nevertheless, lower than whites'. Klineberg doubted that Kent County could be so exceptional. I am sure it is not. Probably the only member of APA who was born and grew up in Kent County, I feel bound to describe Tanser's population as it was when I want /went/ to school with it in the 'twenties and 'thirties.
>
> The Negroes lived in the East End, and in a few spots on the outskirts of town. Nearly all of their houses were small wooden buildings, often lacking paint and tending towards dilapidation. The theaters had a policy of seating Negroes in certain areas. The all-Negro school had been abandoned by my day. My elementary school classes always included Negro children, but I remember none during the last 3 years of high school. My Negro classmates were usually poorly clothed and badly groomed. Negroes held the low-status jobs. They were the servants, garbage collectors, the odd-job men. People called them"Nigger" more often than "Negro." I did not know until I grew up that a Negro could be a doctor, lawyer, teacher, member of Parliament, or even a clerk in a store. The only Negro boy of my acquaintance who went to college became an MD and went to a larger city to practice. It was often said that ambitious Negroes should go to Detroit where they would have opportunities for advancement.
>
> I cannot conceive of any social advantages which Negroes enjoyed in Kent County at the time of the Tanser study. They did have the political equality contained in the right to vote,

The Dreger-Miller Review and Its Implications

Dreger and Miller (30) attempted a review of comparative psychological studies of Negroes and whites in the United States. Under "Psychomotor Development," they quoted McGraw as the only study which showed differences in infants and McGraw has been previously mentioned as having repudiated her study. On the other hand, they quoted Scott for measurements which showed no differences. Michelson (1943) was quoted to show that weight patterns are very similar when individuals are placed on the same dietary regime. Gilliland (1951) was quoted for three separate studies, one of which controlled four major variables. Negro infants in the study had IQs as high as or higher than white infants.

Codwell's (1949) study is included in Miller and Dreger's survey. Codwell separated a Negro group into three groups varying in degrees of Negroidness. Composite motor function did not change from one group to another, implying no difference between those more Negroid and those more white.

Dreger and Miller stated that the remainder of the comparisons of psychomotor and physical development indicated that white and Negro children represent the same populations in respect to each of the variables measured.

Socio-Economic Status and Intelligence

Horton and Crump (63) analyzed descriptively some of the background characteristics of a group of three-year-old Negro children whose scores on the Merrill-Palmer Scale of Mental Tests indicate above or below

average performance. They chose sex, birth weight, height and weight at 36 months as characteristics of the child that should be investigated. Socio-economic status, education of the parents, employment status of the mother, number of siblings, marital status of parents, and occupation of the father were family characteristics that were examined. The physical status of the child was not significant to his intelligence functioning. They do suggest that their data inferred that socio-economic status makes a difference. They refrained from such an assertion because the N was too small for statistical analysis. Median education for fathers of the "very superior" children was 16 years (college graduate). No clear relation was seen between mothers' employment status and development of the child at age three. Fewer siblings were the rule among superior children. Sexton (117) found a positive relation between the income of a family and the grade placement scores of pupils in a large urban school district. Murray (96), in his study of Negro children and social status, concluded that within the Negro group the children from middle-class homes scored higher on four criterion measures than children from the lower class.

Mitchell (94) showed a high correlation between income and happiness factors, as identified on the California Test of Personality; and Montague (95) concluded that social status aided school adjustment. Haggard (52) separated his groups into low-status and high-status groups for a test-retest design. The treatment was practice on items from the test. Haggard (52) concluded that:

> The most general finding of this experiment was that low-status children showed an overall gain in performance between the initial and final tests which was at least as great as, if not somewhat greater than, that of the high-status children.

Eells et al (34) have shown the effect of culture on test scores and they feel that children from a high-status home have a definite advantage.

Alexander et al (1), in The Management of Racial Integration in Business, spoke of the difference in cultural understanding of Negroes and whites as candidates for a job. He showed how the difference in economic backgrounds affect test results. He used, as an example, a series of four pictures, three of which have nothing abnormal. The applicant is instructed to select the one picture which contains a defect of some kind. The fourth picture depicts a busy living room scene, and there is a crack in one of the windows in the background. The crack might be obvious to someone who is not used to seeing cracked windows. However, to many Negroes, a cracked window is a very common sight. Therefore, it is more unlikely that Negroes will identify the correct picture as readily as will a white applicant.

Matched Group Comparisons

It is highly unfortunate that so many descriptive studies have been used in the controversy of innate differences between groups, and that there have been so few studies that have attempted to control the variables that might be causing the differences. McCord and Demerath (83) found that there was no difference in intelligence between a group of white boys and a group of Negro boys who attended the same school in the Boston area when socio-economic class was held rather constant. McQueen and Churn (89) found no significant difference in intelligence when they matched Negro and white boys. Their sample consisted of 55 Negro and 55 white boys in Nevada. Anastasi and D'Angelo (5) summarized their study as follows:

Measures of linguistic development and Goodenough Draw-a-Man IQ were obtained on 100 5-year old Negro and white children attending New York Department of Welfare Day Care Centers. The subjects included 25 Negroes and 25 whites living in uni-racial, unmixed neighborhoods, and 25 Negroes and 25 whites living in inter-racial, mixed neighborhoods. The sex ratio was approximately the same in these subgroups. Socio-economic and other background factors were relatively uniform in all groups.

No significant race differences were found in Goodenough Draw-a-Man IQ, but girls excelled in all subgroups. Mean sentence length yielded a significant Race x Sex interaction. In the white groups, the girls surpassed the boys, while in the Negro groups the boys excelled. This reversal of sex difference among the Negroes was more pronounced in the unmixed neighborhood. . . .

Curti (22) carried out a study in Jamaica on the island of Grand Cayman. She thought Grand Cayman to be a natural laboratory for racial testing for several reasons:

1. English is the spoken language.
2. The island is small enough (20 miles long) so that all the children of a given age in school could be tested.
3. A sizeable part of the population had remained "pure white" while there were large numbers of brown and black people.
4. The island at the time of the study was quite isolated and all the inhabitants were living in an unusually simple environment. There was no regular steamship service, no railroad, moving picture theater, newspaper, and the roads were generally poor. There were a few automobiles and a few telephones. There were no government schools above the elementary level and no private schools above the secondary level.

There were many white families who had been exposed to this simple environment for several generations. People of all colors were restricted to a rather narrow range of occupational opportunity. In a preliminary testing situation, the education office of Jamaica administered the Goodenough Draw-a-Man Test. "The results were striking . . .," Curti reported. "Black averages are higher than white in 3 out of 5 comparisons. But neither these nor other differences are significant even near the 5 per cent level." All the children tested attended government schools.

In the main study Curti (22) had 122 white, 135 brown, and 86 black children. She concluded:

> In this study the commonly found black inferiority on intelligence tests occurred only in tests for younger children which did not show the advance in age expected of a good test, and in the most academic tests for older children. On three out of five performance tests there were no significant color differences among juniors. The same dark-colored seniors who were inferior to whites in verbal classification, opposites, and analogies, did fully as well in all the non-language tests, including pictorial classification.
>
> The older colored pupils also did as well as the whites in the test involving number relationships and in the final "reasoning test" which called for certain symbolic operations such as characterize the thinking we call reasoning. It is significant that this last test did not employ very uncommon words and did deal with subject matter, such as family relationships and proverbs, with which colored pupils were probably as familiar as the more cultivated white pupils. The present study, then, does not lend support to the conclusion that colored inferiority in intelligence test has a racial basis.

The Range of Negro Intelligence

Jenkins (67) stated that he assembled the records of 18 Negro children who tested above 160 on the Stanford-Binet. Seven of these tested IQs at 170; four tested above IQ 180; and one at IQ 200 on the Binet. Jenkins further stated that analysis of the literature relating to the intelligence performance of Negro children revealed that a number of them have been found in the range that reaches the best one per cent of white children (IQ 130 and above) and at the level of "gifted" children (IQ 140 and above). Moreover, Jenkins stated there are at least sixteen published studies that give an account of Negro children possessing IQs above 130, twelve of the reported cases had IQs of 140. Further, he noted that the populations studied were in Northern urban communities. In addition, Jenkins (67) stated that "Terman found only 15 children

testing as high as IQ 180" and that Hollingsworth reported:

> In twenty-three years seeking in New York City and the local metropolitan area I have found only twelve children who test at or above 180 I.Q. (S-B). It is apparent then, that children who test upwards of Binet I.Q. 160 are extreme deviates in psychometric intelligence and representative of the very brightest children in America.

Regional Variations and Social Class

Klineberg (72) reported that Negro children in Harlem from the South increased their IQs the longer they were in the North. More recently, Lee (74) conducted a similar study in Philadelphia. He examined the test scores of the same group of children as they progressed through the City's school system. The Southern-born Negro students, while increasing their IQ regularly, never did catch up with their Northern-born classmates.

Roberts (110) of Fisk University reported to the APA meeting of that year that a study of the performance of Fisk University students on the ACE examination and their socio-economic status revealed that subjects with fathers in the upper socio-economic levels from the North scored higher than their Southern counterparts. However, by the time the two groups were seniors, the differences disappeared.

Comparative Achievement Levels of White and Negro Groups

Achievement as previously defined in this study was declared to be a sample of the knowledge of English, Mathematics, Social Science, and Natural Science. John Dewey (27), writing on discipline, stated:

A person who is trained to consider his actions to undertake them deliberately, is in so far forth disciplined. Add to this ability a power to endure in an intelligently chosen course in face of distraction, confusion, and difficulty, and you have the essence of discipline. Discipline means power at command; mastery of the resources available for carrying through the action undertaken. To know what one is to do and to move to do it promptly and by use of the requisite means is to be disciplined, whether we are thinking of an army or a mind. Discipline is positive. To cow the spirit, to subdue inclination, to compel obedience, to mortify the flesh, to make a subordinate perform an uncongenial task--these things are or are not disciplinary according as they do or do not tend to the development of power to recognize what one is about and to persistence in accomplishment.

It is hardly necessary to press the point that interest and discipline are connected, not opposed. Even the more purely intellectual phase of trained power--apprehension of what one is doing as exhibited in consequences--is not possible without interest. Deliberation will be perfunctory and superficial where there is no interest. Parents and teachers often complain--and correctly--that children "do not want to hear, or want to understand." Their minds are not upon the subject precisely because it does not touch them; it does not enter into their concerns.

This quotation from John Dewey points out the importance of learning experience being relevant to the major concerns of the child.

Maslow (80) depicted human needs as being hierarchal in nature. He postulated that those needs with a physiological base are prepotent as long as they remain unsatisfied. When they are satisfied, however, the higher needs occupy the individual's attention and effort. Maslow (80) saw human needs in this descending level of importance:

1. Physiological
   a) Hunger
   b) Thirst
   c) Sex
2. Safety
3. Love
4. Esteem
5. Self-Actualization

Self-actualization is last in this hierarchy of needs. School achievement for children would fall last in this hierarchy. The U.S. Census for 1960 showed in Table 223 of Volume I that 60 per cent of American

Negroes with families made less than $4,000 per year. Recent unemployment figures showed that the Negro is considerably more likely to be out of work than his white counterpart. Roberts and Nichols (109), in a recently released report of The National Merit Scholarship Corporation, stated:

> . . . The median income of the Scholars' families ($8,300) was significantly higher than that of the Finalists' families ($6,000). The tendency for the selection procedure to identify students from higher income homes was almost certainly due to a real relationship between academic ability and economic status.

The experimenter placed these philosophical and sociological data antecedent to achievement studies to point up the nature of achievement. It would seem that for optimal development in achievement, as previously defined, students should understand the material as being relevant to their immediate needs. Or there must be a conscious upward mobility goal. Robert Merton (90) called the latter situation "anticipatory socialization." The individual anticipates becoming a part of another class. Hence, he adopts the behavior of his reference group.

Achievement Studies

Findley (37) found that the differences between white and Negro children increased from the early to the late years. He tested all children in the Atlanta school system at Grades 4, 6, and 9 with tests of reading and arithmetic. His results showed increasing disparity between whites and Negroes with longer educational exposure. The whites showed the higher achievement level.

Semler and Iscoe (116) studied the learning abilities of Negro and white children. They used paired-associate learning tasks. The ages of the children ranged from five through nine. The mean age of the whites was 7-2 and for the Negroes 7-4. The subjects were randomly selected by ages from lists furnished by the schools. Each child was first administered a Wechsler Intelligence Scale for Children (WISC), using trained examiners. After approximately a week, each child was administered the paired-associate learning task having been randomly assigned to one of four experimental conditions. In all 275 children were tested. The results were as follows:

> The analysis of variance for the 124 white and 124 Negro subjects under the four conditions yielded an F of 81.73 which, with 3 and 240 degrees of freedom, is significant at the .001 level. Nonsignificant Fs for race and the race by condition interaction were obtained. It is apparent that, while the conditions yielded significantly different rates of learning, the two races did not differ in this respect nor was any one condition significantly more difficult for either race.

Osborne (103) studied patterns of intellectual and school achievement growth of white and Negro children over a four-year period. He started his longitudinal study during April 1954. He retested in 1956 and 1958. There were 815 white and 446 Negro children who were tested on the three dates. He reported:

> . . . it is seen that the Negro-white achievement differences of almost two years at Grade 6 increased steadily until at Grade 10 the difference in reading level was over three school grades. The amount of overlap was less at the 10th grade than it was at the 6th. This widening gap in achievement between the two groups is apparent on both the vocabulary and comprehension sub-tests as well as for the total reading scale.
>
> The picture in arithmetic is the same as for reading. At the 6th grade white-Negro differences were just over one grade for the areas covered by the California Arithmetic Test. In the 8th grade the two groups maintained their relative positions in arithmetic reasoning but on the test of arithmetic fundamentals the Negro group was now nearly two grades behind the white pupils. Four years after the initial testing when both groups were examined during the second semester of their 10th

school year, there was a difference in arithmetic achievement of over four grades between the groups. The arithmetic grade placement level of the Negro 10th grade pupils was only slightly above the 6th grade national norms, while the white group tested at the 10th grade on the same norm group. In other words, in terms of arithmetic skills, especially fundamental operations involving only numbers, white children in the 6th grade were not only significantly above the 6th grade Negro group but were also equal in these skills to 8th and 10th grade Negro pupils.

Osborne (103) concluded his study with the following remarks:

> The trend for lower IQs to be found among Negro than among white children has been attributed to poor early environment and limited edutional opportunities./ The environmental interpretation, however, leaves unexplained the reason both Negro and white groups of the lowest initial intelligence earn higher IQs at later ages while the bright children of both races tend to earn lower scores on subsequent testings. Even those who argue most strongly for the environmental interpretation of test differences would concede that the bright children of both groups would not likely be from low status, non-stimulating homes. Nor would one expect to find most dull children of both races in stimulating, high status homes. . . .
>
> The above findings seem to lessen the importance of the so-called cultural bias of test items and differential educational opportunities as explanations for the racial differences in test performance and to suggest the need for research designed to explore developmental and motivational factors which may be related to IQ and achievement test differences between white and Negro children.

Newton and West (100) reported that in 1963 Georgia had 39.7 per cent of its non-white population classified as functional illiterates. If this was so, Osborne's argument is weakened. Children coming from the homes of functional illiterates could hardly be expected to compete with children who come from the dominant racial group. In addition to the functional illiteracy report, Newton and West (100) reported that the Southern states were still spending more per pupil per white child than they were spending to educate Negro children. To illustrate, in 1956-57 North Carolina was spending $137.76 per white child but only $130.63 per Negro child; South Carolina was spending $143.33 per white child and $110.33 per Negro child; Mississippi was spending $128.51 per white child and $78.67 per Negro child; and Louisiana was spending $211.94 per white

child and $166.83 per Negro child. When the pupil expenditure records of the early fifties are thus checked, there are large differences which may well point up the quality of education received by previous school generations of Negro children and who are now the parents of the present school children.

Osborne (103) stated that he assumed that the bright Negro children were coming from stimulating homes and yet they had a regression of IQ. But he did not check this assumption for either race. The phenomena which Osborne observed was a regression toward the mean.

Stallings (125) reported:

> The situation in Louisville public schools prior to integration was not notably different from that reported elsewhere either as to scholastic achievement or intelligence as measured by standardized tests. For the year 1955-56 the mean score on the California Reading Test given in April to the second grade pupils was 3 years 4 months for white and 2 years 9 months for Negroes. The Stanford Intermediate Battery given in January to the sixth grade revealed a mean score of 6 years 0 months for whites and 4 years 8 months for Negroes. At the eighth grade level where the Coordinated Scales of Attainment were administered, the average of the mean scores in the several subjects was 7 years 4 months for the whites and the Negro pupils corresponding figure was 6 years 3 months. Thus the difference in achievement was 5 months at the second grade and in excess of a year at both the sixth and the eighth grade levels.

For the school year 1955-56, Stallings ( ) reported:

> . . . As to Mental Age, at the second grade level the results of the Otis Quick-Scoring Mental Ability Test: New Edition showed that the mean mental age for white pupils was 8 years 7 months for both years and 8 years 3 months for Negro pupils for both years. At the sixth grade level the mean Mental Age for white pupils was 11 years, 2 months in 1956-1957. The corresponding figures for Negro pupils were 10 years 3 months in 1955-1956 and 10 years, 3 months in 1956-1957.
>
> For the total group of Negro pupils the amount of gain was three months at the second grade level and an average gain of one month in all subjects at the eighth grade level. In reading at the eighth grade level the gain was four months. /italics in original/

In the Stallings study, the effect of a changed environment and equal educational opportunity brought increased motivation and, hence,

higher levels of achievement to Negro pupils. However, equal educational opportunity without the finances which make it possible to take advantage of the opportunities available did not cause the Negro pupils to equal their white classmates in level of achievement.

Paul Friggens (39) reported on the work of Dr. Sam Shepard in St. Louis. Dr. Shepard is assistant superintendent of St. Louis' Banneker School District. This district has a fifteen-square-mile area with twenty-three elementary schools serving some sixteen thousand culturally disadvantaged children--almost all Negro and staffed by five hundred Negro teachers.

> In 1957-58, when St. Louis switched to the track system, the twenty-three Banneker schools had 47 per cent below average (Track 3); 46 per cent average (Track 2); and only seven per cent in the top level, or Track 1. Today the Banneker schools have reversed the picture. Only 11 per cent are in the low division, and 22 per cent are superior. Thus they have gained about a year and a half across the Banneker District and reached the national norm. Hundreds of children even jumped ahead two years in achievement. In one outstanding example, the Dunbar School, eighth-grade reading scores in five years jumped from 7.3 to 9.4--six months over the expectancy of 8.8

Summary of the Review of the Literature

The comparison of Negro and white groups on intelligence and achievement on pencil and paper tests when the two groups were randomly selected has in most instances showed higher mean scores for the white group. In the Army studies, it seems as if no controls of any kind were used. Subjects were not equated for educational or socio-economic status. In most of the studies involving school children of equal grade level, no control of socio-economic status or the quality of Negro education in the particular state, as compared with that available for white children, was

attempted.

Anastasi and D'Angelo studied preschool children and attempted to control socio-economic factors. Negro preschoolers scored higher than their white counterparts. Curti matched secondary school groups in the West Indies and found no significant differences. McQueen and Churn matched elementary and secondary pupils of both races and found that there were essentially no significant differences. Shuey, Garrett, McGurk, and Osborne, from their studies, came to the conclusion that there was a difference in intelligence between the white and Negro race and that the difference is not in the environment, but in the inheritance. McCord and Demerath denied racial inferiority and stated that there was no difference in intelligence between the two races when the backgrounds of the subjects were equated. Eells, Miller and Dreger, Stallings, Semler and Iscoe, Klineberg, Ginzberg, Pettigrew, and others pointed out the importance of the environment in shaping intelligence and achievement behavior.

While a great number of studies have been content to describe intelligence and achievement behavior of Negro and white groups, without any controls, only a few have attempted to control the crucial factor of socio-economic status. The need to conserve human resources makes it imperative that youth are helped to achieve more of their potential without the stigma of racial inferiority. There exists in the area of controlled studies a gap in the literature.

The Limits of the Study

The writer did not review each study that has been done on Negro and white groups. There have been a large number of such studies made. The writer chose those which he felt were most influential. Compilations of Shuey and the Miller and Dreger study were used because they seemed representative of the universe of this particular area of study. The writer was aware that other cultural factors may be sources of variance, but this study is attempting to hold socio-economic status constant.

A further limit of this study was that the sample was drawn from Oklahoma State University and from Oakwood College. A large number of the students at Oklahoma State University were enrolled in engineering, while a large number of the Oakwood College student body was enrolled in preministerial courses. Moreover, the Oakwood College sample contained many students who are multilingual, while the Oklahoma State sample did not contain many of such students.

Statement of the Hypotheses

There is no significant difference between the intelligence and achievement scores of Negro and white groups matched for socio-economic background.

Ho_1: There is no significant difference between white and Negro groups on intelligence when socio-economic status is not controlled.

Ho_2: There is no significant difference between white and Negro groups on achievement variables when socio-economic status is not controlled.

Ho_3: There is no significant difference between white and Negro groups on intelligence scores when socio-economic status is held constant.

Ho_4: There is no significant difference between white and Negro groups on achievement scores when socio-economic status is held constant.

Ho_5: There is no significant difference between white and Negro groups on achievement scores when both socio-economic status and intelligence test scores are held constant.

A number of assumptions underlie the hypotheses. Some of which are as follows:

Paper and pencil scores of intelligence and achievement represent learned drives..

These learned drives are differentially rewarded at different levels of society.

The higher classes have more cues in their environment, and they experience more reinforcements to elicit and sustain the learned drives of intelligence and achievement.

When the lower class members experience reinforcement from the socializing agent for successive approximation of the learned drives of intelligence and achievement, the behavior will be elicited upon cues and will act as a predominant disposition of behavior in the future.

CHAPTER III

DESIGN AND METHODOLOGY

Subjects

Three hundred seventy-one white subjects and three hundred seventy Negro subjects were tested as subjects for this study. Because of inaccurate information or a lack of information to determine socio-economic status, ninety-four white subjects and one hundred fifteen Negro subjects were dropped from the study. There remained two hundred seventy-seven white subjects and two hundred fifty-five Negro subjects.

The white subjects were students enrolled in introductory psychology, in educational psychology, or in orientation courses at Oklahoma State University, Stillwater, Oklahoma. The Negro subjects were students enrolled at Oakwood College, Huntsville, Alabama. Oakwood College is a liberal arts undergraduate college of approximately 550 students. It is affiliated with the Seventh-day Adventist Church. The students were from all areas of the United States and the faculty is interracial.

The bases for selecting subjects for this study were as follows: (1) they were all in undergraduate school, (2) they were made available as subjects for the study, and (3) they were willing to participate. Hence, the writer cannot claim that his samples meet the criterion of a random sample. A breakdown of the number of subjects appearing in each

of the designated social classes appears in the appendix. The willingness of subjects to participate was a crucial factor.

Instruments

The Henmon-Nelson Test of Mental Ability (Revised Edition) was used as an intelligence measure. The college level of this instrument was published in 1961. Norman Wallen reviewed the test for Buros' Sixth Mental Measurements Yearbook (13). The test consists of 100 items, and it is given in forty minutes. Wallen reported (13):

> One of the interesting features of this test has to do with the item types to be found. Of the total of 100 items, 47 were classified by this reviewer as straight vocabulary definition, 22 as number series, 17 as arithmetic reasoning, 12 as verbal analogies. Of the remaining two, one is a sentence arrangement item and the other is a combination of verbal reasoning and arithmetic skills. . . .
>
> The odd even reliabilities, based on 100 cases are .92 and .89 for Q, .92 and .93 for V, and .95 and .94 for total score on Forms A and B, respectively. Alternate forms testing with an interval of approximately 35 days provided reliabilities of .84 for the quantitative, .88 for the verbal and .89 for the total score. . . .

John Crites also reviewed the test in Buros' Sixth Mental Measurements Yearbook (13) and reported:

> . . . The V scale consists of 60 items, whereas the Q scale is comprised of only 40 items, which may be undesirable for several reasons. Not only is the reliability of the Q score adversely affected. . . but the test is more heavily weighted with the V factor. Also, a count of the items keyed to the two scales in each succeeding fifth of the test reveals that there is a disproportionate number of Q items in the last section of the test. Thus for the slower examinee who fails to complete the test, the total score is based upon a higher ratio of V to Q items than for the examinee who finishes within the time limit. . . . The 1961 revision. . . rather closely approximates the ideal for measures of its kind. It is relatively short, easily administered, quickly scored, acceptably reliable, and reasonably valid.
>
> . . . As a final observation on the rationale for the revision, it would seem that the Henmon-Nelson Test has retained its usefulness as

a predictor of academic success despite the recent emphasis upon multi-factor aptitude batteries and the test authors' acquiescence to this Zeilgeist as manifested in their development of the Q and V scales. . . .

Wallen (13) reported of competing tests that SCAT, CQT, and OSUPE are more dependent on prior school learning than the Henmon-Nelson Test. Thus, the two considerations which caused the experimenter to choose the Henmon-Nelson Test were (1) it is not tied so specifically to prior school learning, although it is highly verbal, and (2) the time limit enabled the experimenter to test within a class period.

The raw scores on the Henmon-Nelson Test were used in the analyses carried out in this study. The standard scores are not given. Percentile rank are the only other scores recorded on the Henmon-Nelson Test.

The ACT battery consists of four subtest, (1) English, (2) Mathematics, (3) Social Science, and (4) Natural Science. Each test is approximately 45 minutes in length. The publisher's statement concerning each test is placed here because all booklets must be returned to the headquarters:

English usage This test samples the student's ability to understand and use the English language. The student's task on this test is to identify cases of improper or faulty English usage and to choose the most acceptable substitute from several alternatives. Most of the test items are concerned with elements of diction, style, phraseology, form and organization in written expression. The remaining items are concerned with correctness of punctuation, capitalization and grammar. The test is constructed to parallel the tasks a student faces in actual writing situations.

Mathematics usage This test samples the student's ability to understand and use the principles and techniques of mathematics. In this sense, it is a test of the student's ability to reason mathematically. Test items involve two kinds of problems: (a) quantitative problems based upon practical situations, and (b) problems presented in formal exercises in algebra, geometry and advanced arithmetic. The test is constructed to parallel actual situations in and out of the classroom in which the student must apply the principles of mathematics.

Social studies reading This test samples the student's ability to understand, analyze and evaluate problems which arise in the social studies fields. The test is designed to differentiate between students who have acquired a broad understanding of principles applicable in these fields and those who have not. Test items consist of reading passages followed by related questions which call upon the student to identify the author's point of view, evaluate his evidence, understand the implications of the evidence, and recognize specious logic. Typical passages concern problems and issues encountered in such fields as political science, sociology, economics, history, geography, psychology and anthropology. Also included in the test are a few factual questions which call upon the student's prior knowledge of the material in these fields.

Natural sciences reading This test samples the student's ability to understand and evaluate the content of selected readings in the natural sciences. The test also includes a number of factual questions designed to measure the student's grasp of basic principles in these areas. A typical passage presents a summary of the procedures and results of a simple experiment. In responding to test questions related to this passage, the student is required to demonstrate his understanding of the purposes of the experiment, the hypothesis and the experimental results, and the conclusions or generalizations which can be inferred from these results.

On each of the four tests, the total number of correct responses yield a raw score. Raw scores are converted into standard scores on a scale from 1 (low) to 36 (high). This scale is the same for all of the tests. The standard scores were used in the analyses carried out in this study. The ACT battery is a measure of school achievement; it is for this reason that it was chosen as an instrument for this study.

The experimenter was aware that he used the raw scores on the Henmon-Nelson and the standard scores on the ACT battery. However, no correlations were made between the two sets of scores. The analysis was done on each set of scores separately. The writer had access to the reporting forms of the ACT test. These forms record Standard Scores and Percentile Rank.

The Two-Factor Index of Social Position

August B. Hollingshead (61), chairman of the Department of Sociology at Yale University, has developed several scales to measure social status. Of his Two-Factor Index of Social Position, he wrote:

> The Two-Factor Index of Social Position was developed to meet the need for an objective, easily applicable procedure to estimate the positions individuals occupy in the status structure of our society. Its development was dependent both upon detailed knowledge of the social structure, and procedures social scientists have used to delineate class position. . . .
>
> Occupation and Education are the two factors utilized to determine social position. Occupation is presumed to reflect the skill and power individuals possess as they perform the many maintenance functions in the society. Education is believed to reflect not only knowledge, but also cultural taste. The proper combination of these factors by the use of statistical techniques enable a researcher to determine within approximate limits the social position an individual occupies in the status structure of our society.

Both education and occupation are scaled. Occupation is scaled from 1 to 7 and weighted by 7. Education is scaled from 1 to 7 and weighted by 4. To calculate the Index of Social Position score for an individual, the scale value for Occupation (1-7) is multiplied by the factor weight for Occupation (7). The scale value for Education (1-7) is multiplied by the factor weight for Education (4). Social class is delineated in the following manner:

Social Class	Range of Computed Scores
I	11-17
II	18-27
III	28-43
IV	44-60
V	61-77

In his book Social Class and Mental Illness, Hollingshead (62) reported the intercorrelations between judged class position, ecological area of residence, education, and occupation of sample families in

New Haven, Connecticut in 1948:

A. Intercorrelations of Scale Variables

	Correlation
Education with residence	.451
Occupation with residence	.505
Occupation with education	.721

B. Criterion Predicted from One Variable

Judged class with residence	.692
Judged class with education	.782
Judged class with occupation	.881

C. Criterion Predicted from Two Variables

	Multiple Correlation
Judged class with residence and education	.870
Judged class with residence and occupation	.926
Judged class with education and occupation	.906

For a complete description of The Two-Factor Index of Social Position, see the appendix.

Statistical Treatment

The subjects were treated as undifferentiated groups, except by race, on the three scores of the Henmon-Nelson Test and the five scores of the ACT battery. An analysis of variance statistic was used to determine the source of variance. An appropriate F test was run. Subjects were then separated into social class as determined by the Two-Factor Index of Social Position. They were also differentiated by race as well as by social position. A stratified analysis of variance was run and Critical Ratios were determined. An analysis of covariance was then run with social-status index and intelligence (Henmon-Nelson Total Score) held constant.

The analysis of covariance was used instead of a matching procedure. Wert, Neidt and Ahmann (141) commented on the analysis of covariance:

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

This chapter will present the findings of the statistical tests used to determine the significance of the results of this investigation. The .05 level of confidence will be used to determine significance on all tests. For convenience, the writer used the analysis of variance technique rather than a *t* test, since the programer did not have a *t* test readily available. However, the square root of the *F* value is the *t* value.

Analysis of Variance

Data for the white and Negro groups were prepared for the Oklahoma State University Computing Center to be used on the IBM 7040 Computer System. The hierarchical analysis of variance program (1061) by E. L. Butler was utilized. This program calculates the sum of squares, and the degrees of freedom for the total group. It also calculates the means, sum of squares, and the mean squares for each sub-group. In commenting on the analysis of variance, Wert, Neidt, and Ahmann (141) stated the following:

Underlying the application of the analysis of variance are several assumptions upon which the development of this method has been used. The more data in an investigation depart from the strict fulfillment of the assumptions the more likely is the investigator to reach erroneous conclusions. In the actual research situation, particularly in the social sciences, it may be doubtful whether this failure is sufficiently great in most situations to invalidate the application of the technique. Recent evidence suggests that the limits of tolerance within which the assumption must be approximated are wider than it was originally thought.

One of the major assumptions in the analysis of variance is that the observations within each category must be random samples. If this condition is not approximated, the effectiveness of the classification cannot be tested accurately.

Another major assumption is that variance within the sub-groups are homogeneous, i.e., they are data from a single normally distributed population. . . . There is increasing evidence, however that the necessity for the homogeneity of variance is not as serious a consideration as it was formerly thought to be.

Thus, it may be concluded that formerly it was thought that the assumption upon which the analysis of variance was predicated must be rigidly met if the classification were to be taken seriously as a scientific tool. However, experience with social science research seems to indicate that some tolerance may be allowed with large samples. LI (76) pointed out that the means and the variances change from sample to sample. Ostle (104) reported that in checking the tables on the t test the reader must remember that the t test of variance is a two-tailed test while the table is set up for a one-tailed test.

The findings for the intelligence variable prior to holding socio-economic status constant are presented in Table I. The F test indicated a significant difference between groups on the Total score and the Quantitative score. The F for the Total score was 24.91. This is significant at the .001 level. The quantitative F was 52.30. Again significance was at the .001 level. On the other hand, the Verbal score yielded an F of 2.34, which is less than that required for significance at the .05 level.

TABLE I

ANALYSIS OF VARIANCE FOR ABILITY VARIABLE FOR SELECTED WHITE AND NEGRO GROUPS

Source of Variation Henmon-Nelson	Sum of Squares	Mean Square Variance	F	P
Total Score				
Between	5221.22	5221.22	24.91	$P < .01$
Within	111298.55	209.60		
Quantitative Score				
Between	2595.89	2595.89	52.30	$P < .01$
Within	260350.97	49.63		
Verbal Score				
Between	238.85	238.85	2.34	$P > .05$
Within	54237.48	102.14		

(1) df 1, 531

(2) F 1, 531 .05 = 3.86; .01 = 6.69

The Total and Quantitative scores significantly favored the Negro sample, which was contrary to what was expected prior to holding socio-economic status constant. The non-significant verbal score was also different from the alternative hypothesis that the white group scores would exceed those of the Negro group prior to controlling for socio-economic status.

In Table II, the means and standard deviations are shown for Table I. Despite the significance of differences between the means, the standard deviations suggested that the two groups were from comparable populations. Garrett (Statistics in Psychology and Education, 1958, p. 303) suggested using an F test to test the significance of difference between two standard deviations. The writer used Garrett's suggested test and found that none of the standard deviations were significant when a two-tailed reading is used.

TABLE II

ANALYSIS OF VARIANCE MEANS
FOR TABLE I

Henmon-Nelson	Means		Common Means	SD	
	White	Negro		White	Negro
Total	58.89	60.16***	56.90	14.35	14.56
Quantitative	19.90	24.31***	22.02	6.64	7.42
Verbal	34.48	35.82	35.12	11.05	9.00

(1) df 1, 533, 276, 255
(2) White 276, N 277
(3) Negro 255, N 256
(4) ***Significant at .001
(5) .05 = 1.96; .01 = 2.59; .001 = 5.18

In Table III, the analysis of variance for the achievement variables for the ACT battery are presented. In all of the five comparisons, without controlling for socio-economic status, the white group mean was significantly higher, as predicted for Negro and white groups. All F's were significant at the .001 level. Again, however, the standard deviations, when tested for homogeneity of variance by Garrett's suggestion, showed that the two groups were from similar populations.

The white composite score mean exceeded the Negro mean by 6.97. The English mean of the white group exceeded the Negro group mean by 6.90. The Mathematics mean of the white group was greater by 7.24. Social Science gave the whites a mean superiority of 6.54. Natural Science superiority of the white group was 6.75.

In Table IV, the means and standard deviations for Table III are presented. While the means were significantly higher in favor of the Negro group, the standard deviations were not significantly different.

TABLE III

ANALYSIS OF VARIANCE FOR ACHIEVEMENT VARIABLES
FOR SELECTED NEGRO AND WHITE GROUPS

Source of Variation ACT (1-5)	df	Sum of Squares	Mean Square Variance	F	P
Composite					
Between	1	6455.42	6455.42	345.23	$P < .001$
Within	531	9914.14	18.67		
English					
Between	1	6342.20	6342.20	280.13	$P < .001$
Within	531	12020.42	22.64		
Mathematics					
Between	1	6978.45	6978.45	217.66	$P < .001$
Within	531	17021.48	32.06		
Social Science					
Between	1	5684.03	5684.03	167.81	$P < .001$
Within	531	17985.24	33.87		
Natural Science					
Between	1	6417.16	6417.16	213.69	$P < .001$
Within	531	15943.33	30.03		

TABLE IV

ANALYSIS OF VARIANCE MEANS FOR TABLE III
ACT MEANS FOR SELECTED NEGRO
AND WHITE GROUPS

ACT	Means White	Means Negro	Common Means	SD White	SD Negro
Composite	21.23	14.26**	17.88	4.12	4.47
English	20.92	14.02**	17.61	4.47	5.00
Mathematics	20.19	12.95**	16.71	4.05	5.83
Social Science	21.70	15.16**	18.56	5.39	6.16
Natural Science	21.53	14.58**	18.19	5.10	5.75

(1) N 533

(2) N White 277

(3) N Negro 256

(4) df White 276

(5) df Negro 255

(6) .05 = 1.96; .01 = 2.59; .001 = 5.18

(7) ** Significant at .01

Two-Way Classification of the Analysis of Variance

for the Henmon-Nelson Test

The data was sorted into social-status index classifications and a second analysis of variance was run. The tables in this section present the Henmon-Nelson stratified analysis of variance. In Table V, the results for three social-status indexes are presented. The Total Score analysis shows a significant F of 40.13, which is significant at .001. The Quantitative Score shows an F of 61.65. Again, significance is at .001. The Verbal Score shows an F of 12.55. F 1, 268 at .05 is 3.87 and 6.72 at .01. Hence, 12.55 is significant at .01, but is less than 13.44 needed for significance at .001.

In Table VI, a further analysis of the Total Score of the Henmon-Nelson is presented.

TABLE V

STRATIFIED ANALYSIS OF VARIANCE FOR THE HENMON-NELSON TEST FOR SOCIO-STATUS INDEX GROUPS I, II, AND III

Source of Variance Henmon-Nelson	df	Sum of Squares	Mean Square Variance	F	P
Total Score					
Between Socio-Status Index	1	8522.09	8522.09	40.13	P <.01
	2	704.31	176.08	.83	P >.05
Within	268	56910.44	212.35		
Quantitative Score					
Between Socio-Status Index	1	2884.34	2884.34	61.65	P<.01
	2	139.76	34.94	.746	P >.05
Within	268	12536.94	46.78		
Verbal Score					
Between Socio-Status Index	1	1439.66	1439.66	12.55	P<.01
	2	626.54	156.64	1.36	P >.05
Within	268	30968.03	115.55		

F 1, 268 3.87 at .05; 6.72 at .01
F 2, 268 3.03 at .05; 4.68 at .01

TABLE VI

MEANS AND CRITICAL RATIOS FOR
TOTAL SCORE - HENMON-NELSON

Stratification	Means	Mean Square	SD	CR	P
Social Status Index I					
White	54.60	265.17	2.22		
Negro	74.57	298.62	7.07	2.72	P <.01
Social Status Index II					
White	55.39	181.72	1.49		
Negro	75.71	96.24	4.01	4.76	P <.01
Social Status Index III					
White	53.73	204.52	1.48		
Negro	67.31	231.51	2.70	4.42	P <.01

(1) Social-Status Index I df 60 .05 = 2.00; .01 = 2.66

(2) Social-Status Index II df 87 .05 = 1.99; .01 = 2.63

(3) Social-Status Index III df 121 .05 = 1.98; .01 = 2.62

Table VI shows that the critical ratios for all three social status indexes were significant at .01.

In Table VII, an analysis determining the source of variance among the three social classes reveals that all three social classes had significant critical ratios at .01. Social-Status Index I had a critical ratio of 3.80. Social-Status Index II had a critical ratio of 4.85, and Social-Status Index III had a critical ratio of 5.0. Social-Status I, with 60 degrees of freedom, needed 2.66 for significance at .01. 3.80 exceeded the required level for significance. Social Status II, with 87 degrees of freedom, required 2.63 at .01 for significance. Table VII shows 4.85 as the critical ratio for Social-Status II. Hence, it exceeded the required reading for significance at .01.

TABLE VII

MEANS AND CRITICAL RATIOS FOR
THE QUANTITATIVE SCORE
HENMON-NELSON

Stratification	Means	Mean Square	SD	CR	P
Social Status Index I					
White	20.80	38.16	.084		
Negro	30.14	49.14	2.24	3.80	P<.01
Social Status Index II					
White	19.63	43.03	.023		
Negro	32.00	39.00	2.55	4.85	P<.01
Social Status Index III					
White	20.28	52.70	.075		
Negro	28.14	55.76	1.41	5.0	P<.05

Social-Status Index I df 60 .05 = 2.00; .01 = 2.66

Social-Status Index II df 87 .05 = 1.99; .01 = 2.63

Social-Status Index III df 121 .05 = 1.98; .01 = 2.62

Social-Status III, with 121 degrees of freedom, required 2.62 as a reading of significance at .01. The Table VII reading of 5.0 is hence significant at .01. The Negro sample scores, therefore, exceeded the white sample scores on the quantitative variables of the Henmon-Nelson at the .01 level of significance.

In Table VIII, the results for the three social classes on the Henmon-Nelson Verbal Score are presented. The table shows that, for Social-Status Index I, the critical ratio of 2.04 is significant at the .05 level, but is less than the 2.66 required for significance at .01. For Social-Status Index II, the table shows a critical ratio of 2.89, which is greater than the required 2.63 at .01. The table shows a critical ratio of 1.71 for Social-Status Index III. This is less than the 1.98 needed for significance at .05. Hence, the Negro sample exceeded the white sample on the verbal score of the Henmon-Nelson in Social Classes I and II but in Social Class III, the two groups did not differ significantly.

TABLE VIII

MEANS AND CRITICAL RATIOS FOR
VERBAL SCORE - HENMON-NELSON

Stratification	Means	Mean Square	SD	CR	P
Social Status Index I					
White	35.07	118.48	1.73		
Negro	44.43	112.62	4.36	2.04	.05 > P > .01
Social Status Index II					
White	36.61	133.77	1.41		
Negro	43.71	36.91	2.46	2.89	P < .01
Social Status Index III					
White	33.38	114.41	1.41		
Negro	39.86	78.48	3.61	1.71	P > .05

(1) Social-Status Index I df 60 .05 = 2.00; .01 = 2.66

(2) Social-Status Index II df 87 .05 = 1.99; .01 = 2.63

(3) Social-Status Index III df 121 .05 = 1.98; .01 = 2.62

Two-Way Classification of the Analysis of Variance for the ACT Test Battery

In Tables IX-XIV, the results for the stratified analysis of variance for the ACT Test Battery are presented. In Table IX, all five ACT variables are significantly higher in favor of the white sample. All five variables are significant at .01. All five F's exceed the required 6.72 for significance at .01. However, all the Social-Status Index F ratios were non-significant except one. The Social-Status Index proved to be significant at .05 with the ACT variable of Natural Science. This means that social status influenced the significant F of 15.29.

TABLE IX

STRATIFIED ANALYSIS OF VARIANCE
FOR THE ACT TEST BATTERY

Source of Variance ACT Battery	df	Sum Squares	Mean Square Variance	F	P
Composite					
Between	1	488.64	488.64	27.87	P<.01
Socio-Status Index	2	179.53	44.88	2.56	P>.05
Within	268	4696.76	17.53		
English					
Between	1	802.07	802.07	38.26	P<.01
Socio-Status Index	2	113.37	28.34	1.35	P>.05
Within	268	5617.75	20.96		
Mathematics					
Between	1	598.09	598.09	18.43	P<.01
Socio-Status Index	2	286.50	71.62	2.01	P>.05
Within	268	8699.16	32.46		
Social Science					
Between	1	206.40	206.40	7.35	P<.01
Socio-Status Index	2	137.71	34.43	1.23	P>.05
Within	268	7526.40	28.08		
Natural Science					
Between	1	401.41	401.41	15.29	P<.01
Socio-Status Index	2	387.49	96.87	3.66	P<.05
Within	268	7069.06	26.38		

F 1, 268 = 3.87 at .05 and 6.72 at .01
F 2, 268 = 3.03 at .05 and 4.68 at .01

In Tables IX - XIV, an analysis is made of each of the ACT variables by the social status index. In Table X, the means and critical ratios for the ACT Composite Score are presented. The critical ratios for Social-Status Index I and II are .98 and .07, respectively. This is less than the required 2.00 and 1.99 needed for significance at .05. Social-Status Index III shows a critical ratio of 53.21, which is highly significant in favor of the white sample.

TABLE X

MEANS AND CRITICAL RATIOS FOR THE ACT COMPOSITE SCORE

Stratification	Means	Mean Square	SD	CR	P
Social Status Index I					
White	22.02	20.69	.15		
Negro	19.57	34.62	2.40	.98	P > .05
Social Status Index II					
White	21.37	15.25	.42	.07	P > .05
Negro	21.14	17.14	1.73		
Social Status Index III					
White	21.11**	16.94	.042		
Negro	16.48	16.40	.076	53.21	P < .01

(1) Social-Status Index I df 60 .05 = 2.00; .01 = 2.66

(2) Social-Status Index II df 87 .05 = 1.99; .01 = 2.63

(3) Social-Status Index III df 121 .05 = 1.96; .01 = 2.62

(4) **Significant at .01

In Table XI, the means and critical ratios for the ACT English Score are presented. Social-Status Index I presents a critical ratio of 1.83. With 60 degrees of freedom, the .05 level of significance requires 2.00.

Social-Status Index II presents a critical ratio of 1.59. The required reading for significance with 87 degrees of freedom is 1.99.

Social-Status Index III presents a critical ratio of 36.70. This is highly significant in favor of the white sample. The required reading for significance at .01 is 2.62 with 121 degrees of freedom.

TABLE XI

MEANS AND CRITICAL RATIOS FOR THE ACT ENGLISH SCORE

Stratification	Means	Mean Square	SD	CR	P
Social Status Index I					
White	22.26	21.53	.06		
Negro	16.71	52.57	2.95	1.83	P > .05
Social Status Index II					
White	21.12	17.96	.47		
Negro	17.71	26.24	2.09	1.59	P > .05
Social Status Index III					
White	19.66**	21.15	.47		
Negro	16.10	20.03	.08	36.70	P < .01

(1) Social-Status Index I df 60 .05 = 2.00; .01 = 2.66
(2) Social-Status Index II df 87 .05 = 1.99; .01 = 2.63
(3) Social-Status Index III df 121 .05 = 1.96; .01 = 2.62
(4) **Significant at .01

In Table XII, the means and critical ratios for the ACT Mathematics Score are presented. Social-Status Index I presents a critical ratio of .94. The required reading for significance was 2.00 for .05 and 2.66 for .01.

Social-Status Index II presents a critical ratio of 1.71. The required level for significance was 1.99 at .05 and 2.63 at .01. Hence, the conclusion of no significant difference between the two racial groups on mathematical achievement scores, when social status is held constant, is justified.

Social-Status Index III presents a critical ratio of 4.48. This is significant and it favors the white sample. The required reading for significance was 1.96 at .05 and 2.62 at .01.

TABLE XII

MEANS AND CRITICAL RATIOS FOR
THE ACT MATHEMATICS SCORE

Stratification	Means	Mean Square	SD	CR	P
Social Status Index I					
White	21.09	38.05	.084		
Negro	17.57	79.95	3.65	.94	$p > .05$
Social Status Index II	.	.	.		
White	20.24	30.93	.062		
Negro	21.00	19.33	1.79	1.71	$P > .05$
Social Status Index III					
White	19.87	29.42	.06		
Negro	14.76	28.83	1.00	4.48	$P < .01$

(1) Social-Status Index I df 60 .05 = 2.00; .01 = 2.66
(2) Social-Status Index II df 87 .05 = 1.99; .01 = 2.63
(3) Social-Status Index III df 121 .05 = 1.96; .01 = 2.62

Hence, the null hypothesis of no significant difference between Negro and white groups, when social status is held constant, must be rejected.

The Mathematical Score analysis shows that Social-Status Index I and II show no significant difference between Negro and white groups when equated for social status. Social-Status Index III presents a highly significant critical ratio which favors the white sample.

In Table XIII, the means and critical ratios for the ACT Social Science Score are presented. Social-Status Index I presents a critical ratio of .03. The required reading at .05 was 2.00 and 2.66 at .01.

Social-Status Index II presents a critical ratio of .005. This is less than the 1.99 required for significance at .05.

Social-Status Index III presents a critical ratio of 3.0. This is greater than the required 1.96 at .05 and 2.62 at .01.

The analysis of the social science variable shows that for Social-Status Index I and II no significant difference exists between the two racial groups. Social-Status Index III was significantly higher for the white group.

TABLE XIII

MEANS AND CRITICAL RATIOS FOR
ACT SOCIAL SCIENCE SCORES

Stratification	Means	Mean Square	SD	CR	P
Social Status Index I					
White	22.06	29.65	.0074	.03	P>.05
Negro	22.00	18.33	1.75		
Social Status Index II					
White	21.99	24.93	.056	.	
Negro	22.00	19.33	1.79	.005	P>.05
Social Status Index III					
White	21.67**	31.66	.058		
Negro	18.28	26.28	.097	3.0	P<.01

(1) Social-Status Index I df 60 .05 = 2.00; .01 = 2.66
(2) Social-Status Index II df 87 .05 = 1.99; .01 = 2.63
(3) Social-Status Index III df 121 .05 = 1.96; .01 = 2.62
(4) **Significant at .01

In Table XIV, the means and critical ratios for the ACT Natural Science Score are presented. Social-Status Index I shows a critical ratio of .03. This is less than the required 2.00 at .05 needed for significance.

Social-Status Index III reports a critical ratio of .60. Required for significance at .05 was 1.99.

Social-Status Index III reports a critical ratio of 5.0. This exceeds the required readings of 1.96 at .05 and 2.62 at .01.

An analysis of the ACT Natural Science variable shows that Social-Status Index I and II reported insignificant critical ratios. The null hypothesis of no significant difference between white and Negro groups when socio-economic status is held constant is sustained in these two instances. On the other hand, the null hypothesis stands rejected for Social-Status Index II. The significant critical ratio of 5.0 was in favor of the white sample.

TABLE XIV

MEANS AND CRITICAL RATIOS FOR
ACT VARIABLE NATURAL SCIENCE

Stratification	Means	Mean Square	SD	CR	P
Social Status Index I					
White	22.07	28.70	.071		
Negro	22.14	24.48	2.02	.03	$P > .05$
Social Status Index II					
White	21.55	25.21	.056		
Negro	23.14	39.81	2.57	.60	$P > .05$
Social Status Index III					
White	21.67**	26.00	.052		
Negro	16.35	24.02	.092	5.0	$P < .01$

(1) Social-Status Index I df 60 .05 = 2.00; .01 = 2.66

(2) Social-Status Index II df 87 .05 = 1.99; .01 = 2.63

(3) Social-Status Index III df 121 .05 = 1.96; .01 = 2.62

(4) **Significant at .01

Analysis of Covariance

An analysis of covariance constituted the final analysis of the data. Intelligence and socio-economic status were the covariates, while the ACT achievement battery was the dependent variable.

In Table XV, the results of tne analysis of covariance for the ACT achievement variables and Socio-Status Index I are presented. The table shows the following F ratios:

Composite	32.69
English	29.45
Mathematics	17.29
Social Science	8.64
Natural Science	7.69

All of the foregoing F ratios are significant at . 01 in favor of the white sample.

TABLE XV

ANALYSIS OF COVARIANCE FOR
ACT ACHIEVEMENT VARIABLES
SOCIO-STATUS INDEX I

Source of Variation ACT Battery	Adjusted Sum of Squares	Variance Estimate	F	P
Composite				
Between	265.42	265.42	32.69	P<.01
Within	479.04	8.12		
English				
Between	460.41	460.61	29.45	P<.01
Within	922.31	15.63		
Mathematics				
Between	415.03	415.03	17.29	P<.01
Within	1415.91	97.00		
Social Science				
Between	120.83	120.83	8.64	P<.01
Within	824.80	13.98		
Natural Science				
Between	110.09	110.09	7.69	P<.01
Within	844.52	14.31		

(1) F 1, 59 .05 = 4.00; .01 = 7.08

(2) Covariates: Social-Status Index and Intelligence

In Table XVI, the means (unadjusted and adjusted) and the standard error of the means for Socio-Status Index I are presented. All of the means are significantly higher for the white sample.

TABLE XVI

MEANS FOR COVARIATE ANALYSIS FOR SOCIO-STATUS INDEX I

Group	Unadjusted Mean	Adjusted Mean	SE Adjusted Mean
Composite			
White	22.02	22.54**	0.39
Negro	19.57	15.51	1.15
English			
White	22.26	22.67**	0.54
Negro	16.71	13.42	1.59
Mathematics			
White	21.09	21.09**	0.67
Negro	17.57	12.90	1.98
Social Science			
White	26.06	22.58**	0.51
Negro	22.00	17.85	1.51
Natural Science			
White	22.07	22.59**	0.52
Negro	22.14	18.07	1.52

**Significant at .01

In Table XVII, the results of the covariate analysis for the ACT achievement variables and Socio-Status Index II are presented. The F ratios were as follows:

Composite	10.36
English	18.41
Mathematics	2.49
Social Science	5.29
Natural Science	1.86

The required reading for significance at .05 with df 1, 86 was 3.95; and at .01 it was 6.92. Hence, the F's for Mathematics and Natural Science were not significant. The Social Science F of 5.29 was significant at .05 but not .01. The significant F ratios were in favor of the white group.

TABLE XVII

ANALYSIS OF COVARIANCE FOR
ACT ACHIEVEMENT VARIABLES
SOCIO-STATUS INDEX II

Source of Variation ACT Battery	Adjusted Sum of Squares	Variance Estimate	F	P
Composite				
Between	93.33	93.33		
Within	774.91	9.01	10.36	P<.01
English				
Between	253.92	253.92	18.41	P<.01
Within	1186.28	13.79		
Mathematics				
Between	58.54	58.54		
Within	2022.45	23.52	2.49	P >.05
Social Science				
Between	92.71	92.71		
Within	1506.20	17.51	5.29	.05>P >.01
Natural Science				
Between	35.67	35.67		
Within	1645.73	19.14	1.86	P >.05

(1) F 1, 86 .05 = 3.95; .01 = 6.92

(2) Covariates: Intelligence and Social-Status Index

In Table XVIII, the means and standard errors for Table XVII are presented.

TABLE XVIII

MEANS FOR COVARIATE ANALYSIS FOR SOCIO-STATUS INDEX II

Group	Unadjusted Mean	Adjusted Mean	SE Adjusted Mean
Composite			
White	21.37	21.37**	0.33
Negro	21.14	17.55	1.22
English			
White	21.12	21.39**	0.41
Negro	17.71	14.59	1.51
Mathematics			
White	20.24	20.56	0.54
Negro	21.00	17.30	1.97
Social Science			
White	21.99	22.31*	0.47
Negro	23.14	19.33	1.78
Natural Science			
White	21.55	21.87	0.49
Negro	23.14	19.33	1.78

df 87 .05 = 1.99; .01 = 2.63

* Significant at .05

** Significant at .01

In Table XIX, the covariate analysis for the ACT achievement variables and Socio-Status Index III are presented. The F ratios are all highly significant in favor of the white group. The F ratios were as follows:

Composite	208.40
English	85.79
Mathematics	78.00
Social Science	59.83
Natural Science	94.61

F 1, 121 requires 3.92 at .05 and 6.84 at .01.

In Table XX, the means and standard errors for Table XIX are presented.

TABLE XIX

ANALYSIS OF COVARIANCE FOR
ACT ACHIEVEMENT VARIABLES
SOCIO-STATUS INDEX III

Source of Variation ACT Battery	Adjusted Sum of Squares	Variance Estimate	F	P
Composite				
Between	1173.15	1173.15		
Within	681.15	5.63	208.40	P<.01
English				
Between	1010.41	1010.41		
Within	1425.14	11.78	85.79	P<.01
Mathematics				
Between	1411.61	1411.61		
Within	2189.75	18.10	78.00	P<.01
Social Science				
Between	934.21	934.21		
Within	1889.25	15.61	59.83	P<.01
Natural Science				
Between	1368.49	1368.49		
Within	1750.15	14.46	94.61	P<.01

(1) F 1, 121 .05 = 3.92; .01 = 6.84

(2) Covariates: Intelligence and Socio-Status Index

TABLE XX

MEANS FOR COVARIATE ANALYSIS FOR
SOCIO-STATUS INDEX III

Group	Unadjusted Mean	Adjusted Mean	SE Adjusted Mean
Composite			
White	21.11	21.86**	0.25
Negro	16.47	14.12	0.46
English			
White	20.58	21.25**	0.36
Negro	16.20	14.07	0.66
Mathematics			
White	19.87	20.64**	0.45
Negro	14.53	12.14	0.82
Social Science			
White	21.67	22.53**	0.42
Negro	18.33	15.63	0.76
Natural Science			
White	21.67	22.42**	0.40
Negro	16.40	14.06	0.74

df 121 .05 = 1.98; .01 = 2.63

* Significant at .05

**Significant at .01

Testing the Hypotheses

In the course of this investigation, statistical tests were made of five major hypotheses.

Hypothesis 1: There is no significant difference between white and Negro groups on intelligence when socio-economic status is not controlled.

This hypothesis was rejected. Tables I and II showed that the Negro sample exceeded the white sample on the Total score of the Henmon-Nelson Test of Mental Ability at the .01 level of significance.

Hypothesis 2: There is no significant difference between white and Negro groups on achievement variables when socio-economic status is not controlled.

This hypothesis was rejected. Tables III and IV showed that the white sample exceeded the Negro sample at the .01 level of significance on all five variables of the ACT battery.

Hypothesis 3: There is no significant difference between white and Negro groups on intelligence scores when socio-economic status is held constant.

Tables V - VIII showed that the Negro sample exceeded the white group of Socio-Status Index I on two of the three scores of the Henmon-Nelson Test of Mental Ability. On the Total score, the Negro sample exceeded the white sample at the .05 level of significance, but at less than the .01 level of significance. This situation was duplicated on the Quantitative score. On the Verbal score the samples showed insignificant differences.

Tables VI-VIII showed that the Negro sample of Socio-Status Index II exceeded the white sample of Socio-Status Index II on the Total score and Quantitative score of the Henmon-Nelson Test of Mental Ability at the .01 level of significance. The Verbal score yielded a critical ratio of 2.89, which is insignificant at the .05 level.

In Tables VI-VIII, the results of the ability variable for Socio-Status Index III were presented. It showed that the Negro sample exceeded the white sample on all three ability variables at the .05 level of significance.

The results on the ability variable were mixed. For Socio-Status Index I and II, the null hypothesis is rejected for the first two variables, but sustained for the third variable. For Socio-Status Index III, Hypothesis 3 stands rejected, for the Negro sample exceeded the white sample on all three variables at the .05 level of significance.

Hypothesis 4: There is no significant difference between white and Negro groups on achievement scores when socio-economic status is held constant.

In Tables IX-XIV, the analysis for Socio-Status Index I showed the following critical ratios:

Composite	.98
English	1.83
Mathematics	.94
Social Science	.03
Natural Science	.03

The five critical ratios were insignificant. Therefore, the null hypothesis was sustained.

The analysis of Socio-Status Index II resulted in the following critical ratios:

Composite	.07
English	1.59
Mathematics	1.71
Social Science	.005
Natural Science	.60

The five critical ratios were insignificant. Therefore, the null hypothesis was sustained.

The analysis of Socio-Status Index III presented the following critical ratios:

Composite	53.21
English	36.70
Mathematics	4.48
Social Science	3.0
Natural Science	5.0

The five critical ratios were significantly high in favor of the white sample. Therefore, the null hypothesis must be rejected under the boundary limits of the study and the specificity of Socio-Status Index III.

Hypothesis 5: There is no significant difference between white and Negro groups on achievement scores when both socio-economic status and intelligence test scores are held constant.

Table XV presented the analysis of covariance for Socio-Status Index I. All five F ratios were significant at .01 in favor of the white sample. Therefore, the null hypothesis was rejected.

Table XVII presented the analysis of covariance for Socio-Status Index II. The Composite F ratio of 10.36 was significant at .01. The English F ratio of 18.41 was significant at .01. The Mathematics F of 2.49 was insignificant. F 1, 86 required 3.95 for significance at .05, and 6.92 for significance at .01. Social Science was significant (F=5.29) at .05, but was shy of the .01 level of significance. The Natural Science F ratio of 1.86 was insignificant.

Table XIX presented the analysis of covariance for Socio-Status Index III. All five of the F ratios exceeded the required level of significance of .01. All five of the significant F ratios were in favor of the white sample.

The fifth null hypothesis was rejected completely in Socio-Status Index I and III. In Socio-Status Index II, it was rejected on three of the five variables and sustained in two instances. However, since the null hypothesis was rejected on the composite score variable, the writer will treat the hypothesis as having been rejected in favor of the white sample.

This chapter presented the data and also tested the five major null hypotheses. Chapter V presents a summary of the findings, a discussion of the findings, and recommendations.

CHAPTER V

CONCLUSIONS

Summary and Discussion of the Findings

This dissertation attempted to study the relationship of socio-economic status and intelligence and achievement scores of Negro and white groups. The results, while not clearcut, tend to support the hypothesis that measured differences on intelligence and achievement tests between Negro and white groups are to a large degree a function of economic differences between the two groups.

Prior to holding the socio-status index constant, an analysis of variance was run on the three scores of the Henmon-Nelson Test of Mental Ability and the five scores of the ACT battery. The results showed that the Negro sample exceeded the white sample on the Total score of the Henmon-Nelson test at the .05 level of significance. This was unusual, for generally the white sample exceeds the Negro sample. The writer hypothesized several reasons for this unusual occurrence. First, the Oakwood College has a large number of students enrolled in courses leading to verbal occupations; i.e., ministry, secretarial science, and teaching. Second, Oakwood College draws a number of West Indian as well as American Negroes. In addition, many of the students are multilingual, and some of the teachers speak several languages. The verbal nature of

the Henmon-Nelson test leads the writer to hypothesize that the nature of the Oakwood College sample may have influenced the scores.

Sinai Frenkel (38), in an unpublished Ph.D dissertation, found that his Oakwood College sample scored significantly higher on a vocabulary test than did the Oklahoma State University white sample.

The achievement scores on the ACT battery were significantly higher for the white sample prior to holding constant the socio-status index. Writers, such as Garrett, Shuey, and McGurk, have utilized such findings from past studies to infer that Negroes as a group were inferior in intelligence and school achievement than were whites as a group.

Many of the early studies had serious defects in methodology. There were few serious attempts to control variables that might explain the reason for the differences. The Army studies mentioned in Chapter II did not compare people of similar educational background. Even people of the same educational level, i.e., grade level, may not have had the same quality of education. The Supreme Court ruling of 1954 on school segregation highlighted this point. In addition, two people may be in the same educational environment and one may be able to exploit it more effectively. A minority group in a hostile majority environment may find it difficult to forget their social environment and concentrate upon their intellectual development.

Further, the comparative economic resources of two people in the same environment may determine which one might effectively exploit the environment. The National Merit Scholarship Program for Negroes tends to support this view. The Merit Corporation (109) reported that there was a sharp break in family income between Negro students who became scholars and those who were finalist. The average family income for scholars was

$8,300, while family income for the finalist was $6,000.

Since the writer has previously commented on the fact that the Negro sample scored significantly higher on the Henmon-Nelson test and since this fact was maintained after equating socio-status index, the writer will direct his attention to the achievement variables.

Before controlling for socio-status, the white sample was significantly superior. However, when the samples were equated by covariance and socio-status index was held constant, the results were different. The results showed that for Socio-Status Index I and II (families of higher educational and/or occupational levels) there were no significant differences between the two racial groups. Socio-Status Index III yielded significant critical ratios for the white sample on four of the five achievement variables. Only the Social Science variable yielded insignificant results.

Hypothesis 4 stated: There is no significant difference between white and Negro groups on achievement scores when socio-economic status is held constant. For Socio-Status Index III, this hypothesis must be rejected for the Composite, English, Math, and Natural Science achievement scores on the ACT battery. The writer hypothesized that there is an increase in the difference in income between white and Negro groups in categories III, IV, and V of the socio-status index scale. A corollary hypothesis is that there is a minimum environment which will produce the intelligence and achievement syndrome. Wattenberg (139) supported the first hypothesis and McCelland (81) the second hypothesis.

Wattenberg (139) reported that the ratio of white to non-white income varies, but white is always higher. He further reported the following

figures to substantiate his point:

Years of school completed	Male	
	Non-white	White
No school years completed	$1042	$1569
8 years completed	2900	3981
High school 1-3	3253	5013
High school 4	3735	5529

McCelland (81) felt that people develop according to the opportunities which they have. Bruner (13) hypothesized that people develop according to the tools which they have available to them.

The covariance analysis showed that when intelligence and social-status index were controlled, the white sample scored significantly higher on the five variables of the ACT achievement battery. The writer hypothesized that scholastic achievement has not been positively reinforced in the Negro student to the same degree that it has been reinforced in the white student. Wattenberg's (139) wage differential report seems to support this view. Scholastic achievement seems to represent commensurate financial reward or incentive in the American culture at large. However, this is not true for the Negro for the present. Many Negroes are under-employed in the United States today. This may serve to give scholastic achievement a rather dubious value among many Negro Americans.

Recommendations

Because only a few Negroes fell into Socio-Status Indexes I-III and fewer whites fell into Socio-Status Index IV and V, the equated sample was smaller than the writer would have liked. Also, the peculiar nature of the Oakwood College sample makes generalizations difficult. However, the Negroes in Socio-Status I and II equaled their white counterparts

on intelligence and achievement.

The writer would recommend that further research be done using the Three-Factor Index of Social Position (education, occupation, and income). This, of course, produces the problem of securing subjects who are knowledgeable about the family's income and who are willing to disclose the family business to the experimenter.

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APPENDIX A

THE TWO FACTOR INDEX OF SOCIAL POSITION

I. Introduction.

The Two Factor Index of Social Position was developed to meet the need for an objective, easily applicable procedure to estimate the positions individuals occupy in the status structure of our society. Its development was dependent both upon detailed knowledge of the social structure, and procedures social scientists have used to delineate class position. It is premised upon three assumptions: (1) the existence of a status structure in the society; (2) positions in this structure are determined mainly by a few commonly accepted symbolic characteristics, and (3) the characteristics symbolic of status may be scaled and combined by the use of statistical procedures so that a researcher can quickly, reliably, and meaningfully stratify the population under study.

Occupation and education are the two factors utilized to determine social position. Occupation is presumed to reflect the skill and power individuals possess as they perform the many maintenance functions in the society. Education is believed to reflect not only knowledge, but also cultural tastes. The proper combination of these factors by the use of statistical techniques enable a researcher to determine within approximate limits the social position an individual occupies in the status structure of our society.

II. The Scale Scores.

To determine the social position of an individual or of an household two items are essential: (1) the precise occupational role the head of the household performs in the economy; and (2) the amount of formal schooling he has received. Each of these factors are then scaled according to the following system of scores.

A. The Occupational Scale.

1. Higher Executives, Proprietors of Large Concerns, and Major Professionals.

a. Higher Executives

Bank Presidents; Vice-Presidents
Judges (Superior Courts)
Large Business, e.g., Directors, Presidents, Vice-Presidents, Assistant Vice-Presidents, Executive Secretary, Treasurer
Military, Commissioned Officers, Major and above,
Officials of the Executive Branch of Government, Federal, State, Local, e.g., Mayor, City Manager, City Plan Director, Internal Revenue Directors,
Research Directors, Large Firms

b. Large Proprietors (Value over $100,000[1])

Brokers
Contractors
Dairy Owners
Lumber Dealers

c. Major Professionals

Accountants (C.P.A.)
Actuaries
Agronomists
Architects
Artists, Portrait
Astronomers
Auditors
Bacteriologists
Chemical Engineers
Chemists
Clergyman (Professionally Trained)
Dentists
Economists
Engineers (College Grad.)
Foresters
Geologists
Lawyers
Metallurgists
Physicians
Physicists, Research
Psychologists, Practicing
Symphony Conductor
Teachers, University, College
Veterinarians (Veterinary Surgeons)

2. Business Managers, Proprietors of Medium Sized Businesses, and Lesser Professionals.

a. Business Managers in Large Concerns

Advertising Directors
Branch Managers
Brokerage Salesmen
District Managers
Executive Assistants
Executive Managers, Govt. Officials minor, e.g., Internal Revenue Agents
Farm Managers
Office Managers
Personnel Managers
Police Chief, Sheriff
Postmaster
Production Managers
Sales Engineers
Sales Managers, National Concerns
Sales Managers (Over $100,000)

b. Proprietors of Medium Businesses (Value $35,000-$100,000)

Advertising Owners (-$100,000)
Clothing Store Owners (-$100,000)
Contractors (-$100,000)
Express Company Owners (-$100,000)
Fruits, Wholesale (-$100,000)
Furniture Business (-$100,000)
Jewelers (-$100,000)
Labor Relations Consultants
Manufacturer's Representatives
Poultry Business (-$100,000)
Purchasing Managers
Real Estate Brokers (-$100,000)
Rug Business (-$100,000)
Store Owners (-$100,000)
Theater Owners (-$100,000)

c. Lesser Professionals

Accountants (Not C.P.A.P
Chiropodists
Chiropractors
Correction Officers
Director of Community House
Engineers (Not College Grad.)
Finance Writers
Health Educators
Librarians
Military, Commissioned Officers, Lts., Captains
Musicians (Symphony Orchestra)
Nurses
Opticians
Pharmacists
Public Health Officers (M.P.H.)
Research Assistants, University (Full-time)
Social Workers
Teachers (Elementary and High)

3. Administrative Personnel, Small Independent Businesses, and Minor Professionals.

a. Administrative Personnel

Adjusters, Insurance
Advertising Agents
Section Heads, Federal, State, and

Chief Clerks
Credit Managers
Insurance Agents
Managers, Department Stores
Passenger Agents--R.R.
Private Secretaries
Purchasing Agents
Sales Representatives
Local Government Offices
Section Heads, Large Businesses and Industries
Service Managers
Shop Managers
Store Managers (Chain)
Traffic Managers

b. Small Business Owners (6,000-$35,000)

Art Gallery
Auto Accessories
Awnings
Bakery
Beauty Shop
Boatyard
Brokerage, Insurance
Car Dealers
Cattle Dealers
Cigarette Machines
Cleaning Shops
Clothing
Coal Businesses
Convalescent Homes
Decorating
Dog Supplies
Dry Goods
Electrical Contractors
Engraving Business
Feed
Finance Co., Local
Fire Extinguishers
5 & 10
Florist
Food Equipment
Food Products
Foundry
Funeral Directors
Furniture
Garage
Gas Station
Glassware
Grocery-General
Hotel Proprietors
Inst. of Music
Jewelry
Machinery Brokers
Manufacturing
Monuments
Package Store (Liquor)
Painting Contracting
Plumbing
Poultry Producers
Publicity & Public Relations
Real Estate
Records and Radios
Restaurant
Roofing Contractor
Shoe
Shoe Repairs
Signs
Tavern
Taxi Company
Tire Shop
Trucking
Trucks and Tractors
Upholstery
Wholesale Outlets
Window Shades

c. Semi-Professionals

Actors and Showmen
Army M/Sgt; Navy C.P.O.
Artists, Commercial
Appraisers (Estimators)
Clergymen (Not professionally trained)
Concern Managers
Deputy Sheriffs
Morticians
Oral Hygienists
Photographers
Physio-therapists
Piano Teachers
Radio, T. V. Announcers
Reporters, Court
Reporters, Newspaper

Dispatchers, R.R. Train
I.B.M. Programmers
Interior Decorators
Interpreters, Court
Laboratory Assistants
Landscape Planners
Surveyors
Title Searchers
Tool Designers
Travel Agents
Yard Masters, R.R.

d. Farmers

Farm Owners ($25,000-35,000)

4. Clerical and Sales Workers, Technicians, and Owners of Little Businesses (Value under $6,000)

a. Clerical and Sales Workers

Bank Clerks and Tellers
Bill Collectors
Bookkeepers
Business Machine Operators Offices
Claims Examiners
Clerical or Stenographic
Conductors, R.R.
Employment Interviewers
Factory Storekeeper
Factory Supervisor
Post Office Clerks
Route Managers (Salesmen)
Sales Clerks
Shipping Clerks
Supervisors, Utilities, Factories
Toll Station Supervisors
Warehouse Clerks

b. Technicians

Camp Counselors
Dental Technicians
Draftsmen
Driving Teachers
Expeditor, Factory
Experimental Tester
Instructors, Telephone Co., Factory
Inspectors, Weights, Sanitary Inspectors, R.R., Factory
Investigators
Laboratory Technicians
Locomotive Engineers
Operators, P.B.X.
Proofreaders
Safety Supervisors
Supervisors of Maintenance
Technical Assistants
Telephone Co. Supervisors
Timekeepers
Tower Operators, R.R.
Truck Dispatchers
Window Trimmers (Store)

c. Owners of Little Businesses.

Flower Shop ($3,000-$6,000)
Newsstand ($3,000-$6,000)
Tailor Shop ($3,000-$6,000)

d. Farmers

Owners ($10,000-$20,000)

5. Skilled Manual Employees.

Adjusters, Typewriter
Auto Body Repairers
Bakers
Barbers
Blacksmiths
Bookbinders
Boilermakers
Brakemen, R.R.
Brewers
Bulldozer Operators
Butchers
Cabinet Makers
Carpenters
Casters (Founders)
Cement Finishers
Cheese Makers
Chefs
Compositors
Diemakers
Diesel Engine Repair & Maintenance (Trained)
Diesel Shovel Operators
Electricians
Electrotypists
Engravers
Exterminators
Fitters, Gas, Steam
Firemen, City
Firemen, R.R.
Foremen, Construction, Dairy
Gardeners, Landscape (Trained)
Glassblowers
Glaziers
Gunsmiths
Gauge Makers
Hair Stylists
Heat Treaters
Horticulturists
Lineman, Utility
Linoleum Layers (Trained)
Linotype Operators
Lithographers
Locksmiths
Loom Fixers
Lumberjacks
Machinists (Trained)
Maintenance Foremen
Installers, Electrical Appliances
Masons
Masseurs
Mechanics (Trained)
Millwrights
Moulders (Trained)
Painters
Paperhangers
Patrolmen, R.R.
Pattern and Model Makers
Piano Builders
Piano Tuners
Plumbers
Policemen, City
Postmen
Printers
Radio, T.V., Maintenance
Repairmen, Home Appliances
Riggers
Rope Splicers
Sheetmetal Workers (Trained)
Shipsmiths
Shoe Repairmen (Trained)
Stationary Engineers (Licensed)
Stewards, Club
Switchmen, R.R.
Tailors (Trained)
Teletype Operators
Toolmakers
Track Supervisors, R.R.
Tractor-Trailer Trans.
Typographers
Upholsterers (Trained)
Watchmakers
Weavers
Welders
Yard Supervisors, R.R.

Small Farmers

Owners (under $10,000)
Tenants who own farm equipment

6. Machine Operators and Semi-Skilled Employees

Aides, Hospital
Apprentices, Electricians, Printers Steamfitters, Toolmakers
Assembly Line Workers
Bartenders
Bingo Tenders
Building Superintendents (Cust.)
Bus Drivers
Checkers
Clay Cutters
Coin Machine Fillers
Cooks, Short Order
Delivery Men
Dressmakers, Machine
Drill Press Operators
Duplicator Machine Operators
Elevator Operators
Enlisted Men, Military Services
Filers, Benders, Buffers,
Foundry Workers
Garage and Gas Station Assistants
Greenhouse Workers
Guards, Doorkeepers, Watchmen
Hairdressers
Housekeepers
Meat Cutters and Packers
Meter Readers
Operators, Factory Machines
Oiler, R.R.
Paper Rolling Machine Operators
Photostat Machine Operators
Practical Nurses
Pressers, Clothing
Pump Operators
Receivers and Checkers
Roofers
Set-up Men, Factories
Shapers
Signalmen, R.R.
Solderers, Factory
Sprayers, Paint
Steelworkers (Not Skilled)
Stranders, Wire Machines
Strippers, Rubber Factory
Taxi Drivers
Testers
Timers
Tire Moulders
Trainmen, R.R.
Truck Drivers, General
Waiters-Waitresses ("Better Places")
Weighers
Welders, Spot
Winders, Machine
Wiredrawers, Machine
Wine Bottlers
Wood Workers, Machine
Wrappers, Stores and Factories

Farmers

Smaller Tenants who own little equipment

7. Unskilled Employees.

Amusement Park Workers (Bowling Alleys, Pool Rooms)
Ash Removers
Attendants, Parking Lots
Cafeteria Workers
Car Cleaners, R.R.
Car Helpers, R.R.
Carriers, Coal
Countermen
Dairy Workers
Deck Hands
Domestics
Farm Helpers
Janitors, Sweepers
Laborers, Construction
Laborers, Unspecified
Laundry Workers
Messengers
Platform Men, R.R.
Peddlers
Porters
Roofer's Helpers
Shirt Folders
Shoe Shiners
Sorters, Rag and Salvage
Stagehands

Fishermen (Clam Diggers)
Freight Handlers
Garbage Collectors
Grave Diggers
Hod Carriers
Hog Killers
Hospital Workers, Unspecified
Hostlers, R.R.
Stevedores
Stock Handlers
Street Cleaners
Unskilled Factory Workers
Truckmen, R.R.
Waitresses--"Hash Houses"
Washers, Cars
Window Cleaners
Woodchoppers

Relief, Public, Private

Unemployed (No Occupation)

Farmers

Share Croppers

This scale is premised upon the assumption that occupations have different values attached to them by the members of our society. The hierarchy ranges from the low evaluation of unskilled physical labor toward the more prestigeful use of skill, through the creative talents of ideas, and the manipulation of men. The ranking of occupational functions implies that some men exercise control over the occupational pursuits of other men. Normally, a person who possesses highly trained skills has control over several people. This is exemplified in a highly developed form by an executive in a large business enterprise who may be responsible for decisions affecting thousands of employees.

B. The Educational Scale

The educational scale is premised upon the assumption that men and women who posses similar educations will tend to have similar tastes and similar attitudes, and they will also tend to exhibit similar behavior patterns. The educational scale is divided into

seven positions: (1) Graduate Professional Training. (Persons who complete a recognized professional course leading to a graduate degree are given scores of 1). (2) Standard College or University Graduation. (All individuals who complete a four-year college or university course leading to a recognized college degree are assigned the same scores. No differentiation is made between state universities, or private colleges.) (3) Partial College Training. (Individuals who complete at least one year but not a full college course are assigned this position. Most individuals in this category complete from one to three years of college.) (4) High School Graduates. (All secondary school graduates whether from a private preparatory school, a public high school, a trade school, or a parochial high school, are assigned the same scale value.) (5) Partial High School. (Individuals who complete the tenth or the eleventh grades, but do not complete high school are given this score.) (6) Junior High School. (Individuals who complete the seventh grade through the ninth grade are given this position.) (7) Less Than Seven Years of School. (Individuals who do not complete the seventh grade are given the same scores irrespective of the amount of education they receive.)

III. Integration of Two Factors

The factors of Occupation and Education are combined by weighing the individual scores obtained from the scale positions. The weights for each factor were determined by multiple correlation techniques.

The weight for each foctor is:

Factor	Factor Weight
Occupation	7
Education	4

To calculate the Index of Social Position score for an individual the scale value for Occupation is multiplied by the factor weight for Occupation, and the scale value for Education is multiplied by the factor weight for Education. For example, John Smith is the manager of a chain supermarket. He completed high school and one year of business college. His Index of Social Position score is computed as follows:

Factor	Scale Score	Factor Weight	Score X Weight
Occupation	3	7	21
Education	3	4	12
	Index of Social Position Score		33

IV. Index of Social Position Scores.

The Two Factor Index of Social Position Scores may be arranged on a continuum, or divided into groups of scores. The range of scores on a continuum is from a low of 11 to a high of 77. For some purposes a researcher may desire to work with a continuum of scores. For other purposes he may desire to break the continuum into a hierarchy of score groups.

I have found the most meaningful breaks for the purpose of predicting the social class position of an individual or of a nuclear family is as follows:

Social Class	Range of Computed Scores
I	11-17
II	18-27
III	28-43
IV	44-60
V	61-77

When the Two Factor Index of Social Position is relied upon to determine class status, differences in individual scores within a specified range are ignored, and the scores within the range are treated as a unit. This procedure assumes there are meaningful differences between the score groups. Individuals and nuclear families with scores that fall into a given segment of the range of scores assigned to a particular class are presumed to belong to the class the Two Factor Index of Social Position score predicts for it.

The assumption of a meaningful correspondence between an estimated class position of individuals and their social behavior has been validated by the use of factor analysis.[2] The validation study demonstrated the existence of classes when mass communication data are used as criteria of social behavior.

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[1]The value of businesses is based upon the rating of financial strength in Dun and Bradstreet's Manual.

[2]See August B. Hollingshead and Frederick C. Redlich, Social Class and Mental Illness, John Wiley and Sons, New, 1958, pp. 398-407.

APPENDIX B

POPULATION USED IN THE ANALYSES

The analyses and conclusions in this study were made on a population broken down as follows:

Social-Status Index I

White		Negro	
Male	Female	Male	Female
15	25	8	12

Social-Status Index II

White		Negro	
Male	Female	Male	Female
25	30	17	25

Social-Status Index III

White		Negro	
Male	Female	Male	Female
31	30	20	40

VITA

Douglass Tyrone Tate

Candidate for the Degree of

Doctor of Education

Thesis: A STUDY OF THE RELATIONSHIP OF SOCIO-ECONOMIC STATUS AND INTELLIGENCE AND ACHIEVEMENT SCORES OF WHITE AND NEGRO GROUPS

Major Field: Student Personnel and Guidance

Biographical:

Personal Data: Born in Memphis, Tennessee, October 1, 1927, the son of Cassell and Queen Esther Tate.

Education: Attended Klondike and Hyde Park Elementary School in Memphis, Tennessee; attended Manassas High School, 1940-41; graduated from Manassas High School in 1949, after taking G.E.D. Test; attended Marconi School of Radio, 1948-49; received the Bachelor of Arts degree from Oakwood College in 1953, with a major in Religion and a minor in History; received the Master of Arts degree from the Seventh-day Adventist Theological Seminary in May, 1955; further work was done at Central State College, Edmond, Oklahoma; University of Oklahoma; and the State University of Iowa, Iowa City, Iowa; received the Master of Science degree, with a major in Counseling, in August, 1964 from Oklahoma State University; completed the requirements for the Doctor of Education degree at Oklahoma State University in May, 1967.

Professional experience: Employed as a machine shop helper, Ferro Machine and Foundry, Cleveland, Ohio, 1942-44 and 1946-49; served in the United States Coast Guard from 11-7-44 to 4-11-46; employed as a plasterer, summers, 1949-52, with the Tate Plastering Company, Memphis, Tennessee; while in college 1949-53, served as dormitory counselor; summer, 1953, employed by Buick Motor Company, Flint, Michigan; from October, 1953 to May, 1954, was employed by Byron Motion Pictures, Washington, D. C.; from 1955 to January, 1959, was employed by the Seventh-day Adventist denomination, this included two years of service in Liberia, West Africa as vice-principal of Konola

Academy; from September, 1959 to May, 1963, was employed by the Oklahoma City School System as a classroom teacher; during the same period of time the writer was employed in the Adult Institute of the Oklahoma City School System; from August, 1964 to the present, the writer has been employed as Director of Testing and Guidance and Assistant Professor of Education at Oakwood College, Huntsville, Alabama.

Professional Memberships:

A.P.G.A. A.C.E. Phi Delta Kappa

The applications of the analysis of covariance are numerous. When testing hypotheses pertaining to the differences in academic achievement this technique is frequently used. Individual differences in ability and aptitude known to exist among students are frequently embodied in such research problems and must be considered in the treatment of the data. In the past such differences, on occasion, have been completely ignored or have been controlled by pairing on the basis of scores representing the differences to be considered. However, precise pairing is often difficult to obtain, and the more effective analysis of covariance method of controlling is used. /underline added/

Chapters I and II contained the philosophical background and definition of the problem. The present chapter contains the methodology and the design of the study. Chapter IV contains the presentation and the analysis of the data.

well be that three-fourths of those classified as Negroes are not indeed a separate racial group if biological modes of classification were used, but they may simply be a specie of the dominant generic group. However, since the dominant group applies sanctions to anyone who calls himself a Negro and since the dominant group applies the stereotype concepts of inferiority to any Negro whom they might meet on the street, the group designated as Negro has the problem of living with the stereotyped notions of the white majority in this country. Hence, it is the person who is sociologically determined a Negro who meets with negative sanctions in this country. Therefore, the findings of this study represent the analysis of two groups that are sociologically determined as white and Negro rather than biologically determined groups.

This study attempted to hold socio-economic class constant in an attempt to determine its effect upon two racial groups who are thought to be different in native intelligence. The environmental press of a stratified society, as it affects intelligence and achievement, needs to be clarified. This is a step beyond descriptive research, which has pointed out group differences. The behavioral scientist must be interested in control and prediction. This study proposes to aid in the accumulative knowledge of human endeavor and, hence, to shorten the time of man's control by esoteric factors. This study differs from previous ones in this area in that (1) it used college students as subjects, (2) it used a factored instrument to determine social position, and (3) the statistical procedures are more sophisticated.

Table Page

XVIII. Means for Covariate Analysis for Socio-Status Index II 70

XIX. Analysis of Covariance for ACT Achievement Variables Socio-Status Index III 72

XX. Means for Covariate Analysis for Socio-Status Index III . . . 73