THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

COMPARATIVE ASSOCIATIVE LEARNING RATES OF FIFTH GRADE WHITE STUDENTS OF HIGH AND LOW SOCIOECONOMIC STATUS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

BY

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Norman, Oklahoma

1974

COMPARATIVE ASSOCIATIVE LEARNING RATES OF FIFTH GRADE WHITE STUDENTS OF HIGH AND LOW SOCIOECONOMIC STATUS

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This study was concerned with the comparison of paired associate learning rates of high and low socioeconomic white children of school age. Subjects involved were 31 fifth-grade students of a high socioeconomic private school and 31 fifth-grade students of public schools located in low socioeconomic areas of Oklahoma City. The testing instrument used was the Hiner 16-picture Paired Associate Learning Task. Prior to attempting the PALT, the subjects had been identified as having IQ's ranging from 94 to 114 as indicated by the Otis-Lennon Mental Ability Test, Elementary Level, Form J.

It was hypothesized that there would be no statistically significant difference between the number of trials-to-criterion and socioeconomic levels nor would there be a statistically significant difference between the number of errors and socioeconomic levels. The level of significance was set at 0.05. A chi-square test with Yates correction was used in the statistical analysis to establish whether the variable of performance and socioeconomic status were significant. No statistically significant results were found relative to either trials-to-criterion or errors and socioeconomic status.

Thus, it would seem fair to conclude that socioeconomic status cannot be considered a factor in the paired associative learning of white children with normal IQ's.

ACKNOWLEDGEMENTS

The author expresses her sincere appreciation to her major professor, Dr. P. T. Teska, for his guidance in the writing of her dissertation and also for his direction of her doctoral program. Without him, neither would have been possible.

Thanks also are extended to committee members Dr. R. E. Ragland, Dr. Lloyd Williams, and Dr. Charlyce King for their assistance and their time. Appreciation is also expressed to Dr. O. J. Rupiper for his contribution to this dissertation.

Finally, the writer would like to acknowledge the patience, support, and encouragement of her husband, Dr. John Allison.

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CHAPTER I

INTRODUCTION

According to Davis (1949), "Half the ability in this country goes down the drain because of the failure of intelligence tests to measure the real mental ability of the children from the lower socioeconomic groups, and because of the failure of the schools to recognize and train this ability." In the same article, he cited studies indicating that many slum children who do poorly in school and on present intelligence tests have higher real or native intelligence than many children from higher income families whose home training enables them to do well on school-types of learning.

Davis feels that present intelligence tests are limited to "school-type programs" and fail to tap many important kinds of mental ability, therefore giving rise to the claim of present group intelligence tests that children of the lower socioeconomic groups are inferior to those of the higher income groups. He claimed that the findings indicated that the usual

intelligence tests measure the cultural and economic opportunities which the child has had rather than his real intelligence, and that not one of the ten most popular group tests of intelligence includes any problem on which the lower socioeconomic groups earn scores superior to the higher socioeconomic group.

Davis (1951) quoted statistics contending that in our country as a whole, more than 60 out of every 100 children live in families of the lower socioeconomic groups and that the majority of these children are white. Statistics also indicated that more than 70 out of every 100 of the elementary school children came from these lower socioeconomic groups. Burnett (1969) made the observation that in 1950 approximately one out of 10 attending public schools in the nation's large cities was of the lower income class; by 1960, it was one out of three, and estimations are that it will be one out of two by 1970. Allen (1969) wrote that in 1967 more than one of every four disadvantaged children in the nation were enrolled in the schools of the 50 largest cities in 28 states.

Anastasi (1958) said that the influence of social class membership upon behavioral development may operate through many channels, and thus may determine the range and nature of intellectual stimulation. Gordon (1965) described the environment of the disadvantaged child as being noisy, disorganized, and overcrowded. It is seen as lacking in the cultural artifacts often associated with development of school

readiness, such as books, a variety of toys, and self-instructional equipment. Children are reported as having been read to less frequently and as having less parental support in academic pursuits.

Montague (1964) indicated that the culture of the environment of low socioeconomic families is different from the culture that has molded the school and its educational theory. The child who enters school under such circumstances is so poorly prepared to produce what the school demands that initial failures are almost inevitable. Deutsch and associates (1967, p. 35) noted that there is evidence that by the time to start school, many disadvantaged children have developed negative self-images, and the school does little to mitigate such concepts. These authors (p. viii) suggested that as disadvantaged children go through school, they tend to lose a sense of confidence and competence, and the failure cycle becomes progressively reinforced. Montague (1964) reported that boys and girls who come from lower-class socially impoverished circumstances account for a high proportion of our school failures and dropouts.

Ausubel (1966, p. 252) also described the environment of the low socioeconomic child. His culturally deprived home lacks the large variety of objects such as utensils, toys, furniture, or pictures that require labeling and that serve as referents for language acquisition in the middle class home. The author stated that the culturally deprived child

is not spoken to or read to very much by adults. The syntactical model provided him by his parents is faulty. He suffers from a paucity of abstractions in the everyday vocabulary of his elders; from a rarity of stimulating conversation in the home; from the relative absence of books, magazines, and newspapers; and from the lack of example of a reading adult in the family setting. Burnett (1969) explained that preoccupation with survival on a day-to-day basis does not permit parents of the low-income families to educationally orient off-spring; poor parents cannot buy books and other educational material on inadequate incomes. Also, the low-income parents cannot serve as educational informational sources to children because of low level of knowledge.

According to Bernstein (1960), linguistic differences other than dialect occur in the normal social environment, and status groups may be distinguished by their forms of speech. This difference is most marked where the gap between the socio-economic levels is very great. Chase and Pugh (1970) concurred when they stated that the language models to which lower class children are exposed are typically meager, restricted, and incorrect grammatically by middle class standards. They also maintained that since group intelligence tests typically require considerable verbal ability, social class has been shown consistently to be related to performance on these instruments. Stevenson, Williams, and Coleman (1971) reported that generally the disadvantaged had more difficulty than the advantaged

children in understanding what they were being asked to do, they required more preliminary instruction, and they appeared to find tasks such as paired associates and category sorting much more boring.

Socioeconomic Status and IQ

Cheyney (1967, p. 14) asserted that the matter of intellectual differences between classes probably has been studied as much as any other factor relating to the culturally disadvantaged. He then questioned whether class differences in scores on intelligence tests represented differences in intelligence or deficiencies in the test, i.e., whether a given test measures any child's capacity to learn or a middle-class child's capacity to learn. Jensen (1968) emphasized the tentative nature of our knowledge relative to genetic and environmental determinants of individual differences in intelligence and educability with their implications concerning social class and race differences.

Dyer (1969) claimed that probably one of the most severe problems in assessing disadvantaged children has to do with test motivation. The consequence is that test scores of the disadvantaged young may seriously under-estimate or distort what they are capable of doing, and, as they get older, the amount of the error owing to lack of motivation may be even greater. Morlan and Ramonda (1968, p. 11) explained that a child who attends school in a depressed area tends to score low on group tests of intelligence. Because of inadequate

pre-school oral language development, he finds many of the test items completely outside the realm of his experiences. This measurement is corroborated by his performance on achievement tests. Siller (1957) reported that high status children do better than low status children on all groups of conceptual ability, particularly those involving verbal material.

Frost and Hawkes (1966, p. 7) stated that work with disadvantaged children indicated that a restrictive environment leads to the learning of responses that are foreign to the expectation of school. The disadvantaged frequently lag behind their peers in the attainment of tasks characteristic of a given age. According to these authors, additional factors of fear and anxiety, rooted in the culture of the home and then reinforced by inappropriate school experiences, prevent the attainment of a more mature level of cognitive development.

In the same vein, Crow, Murray, and Smythe (1966, pp. 11-12), also suggested that prior to his school years, the slum child has lived in an environment which has placed severe limitations on various aspects of his mental development, and, hence, he is likely to arrive at school with a wide variety of cognitive differences. The intellectual performance of these children is likely to be, on the average, ten to fifteen points lower than those of children from other areas. This, the authors pointed out, should be no surprise since many of the tests require the ability to read, and the reading progress of slum area children is also behind that of children from other areas.

Crow, Murray, and Smythe (p. 63) expressed Piaget's viewpoint by saying that he

> . . . has found that a child's ability to learn is related to his prior experience. He believes that prior experiences assist in predetermining the developmental stages of intellectual and cognitive achievements. He further believes that, although the sequence in cognitive development may continue unaltered by experience, various cultural experiences and planned programs of education influence the sequence of stages of intellectual development.

In reviewing the problem of lower IQ scores among culturally and environmentally deprived groups, Klineberg (1963) found no scientifically acceptable evidence for assuming that cultural groups differ in inherited mental ability. Jensen (1969) stated that teachers of the disadvantaged have often remarked that many of these children seem much brighter than their IQ's would lead one to expect, and that even though their scholastic performance is usually as poor as that of middle-class children of similar IQ, the disadvantaged children usually appear much brighter in non-scholastic ways than do their middle-class counterparts in IQ.

Rapier (1968) stated that customary intellectual assessment fails to take into account whether children are low in IQ and achievement due to organic deficiencies or due to an environment which has failed to provide them with the necessary knowledge and skills. According to Ellis (1953), sufficient evidence is available to justify the conclusion that at least a substantial part of the known group differences in IQ's of children from different subcultural groups may be accounted for by cultural bias in intelligence tests.

Researchers such as Rohwer (1966), Jensen (1961) and Rapier (1968), found that performance of lower- and middle-class Negroes, Mexican-Americans and Anglo-Americans, and lower- and middle-class whites does not differ greatly. They found the relation between tested intelligence and learning task performance was higher for the higher socioeconomic groups but negligible for the lower socioeconomic groups. Stevenson, Williams, and Coleman (1971) administered eight learning and eight performance tasks to fifty children in the four to five year age group. The results, according to the authors, give little support to positions positing differences in the learning processes of children of different socioeconomic levels.

Mumbauer (1970) measured the intellectual functioning, impulsivity-reflectivity, paired-associate, and dissemination learning of sixteen male and sixteen female fourth grade students of disadvantaged and advantaged backgrounds. She found socioeconomic differences in intellectual functioning in that the performance of the disadvantaged was the poorer of the two. However, she found no class differences in the learning measures. Presenting a list of twenty-four paired-associates to 384 kindergarten, first, third, and sixth grade children of middle class and lower class backgrounds, Rohwer, et al., (1967) found that those children from the lower class learned as efficiently as those from the middle class despite inferior performance of the former on standardized tests.

Davis (1949) asserted that when tests are changed to use only such words, grammatical constructions, and situations as are about equally common in the environments of all socio-economic groups, a startling increase in the intellectual rating of the lower socioeconomic groups results. On such tests, there is no difference in the percentages of the upper and lower socioeconomic groups who answered the problems correctly. Davis also stated that when tests are made from life experiences which are common to all groups, the researchers found that the average native intelligence of all socioeconomic groups of children is the same. Differences were found between individuals, but there were no differences between socioeconomic groups.

Jensen (1968) reviewed the facts when he stated that it seems that it is in the lack of cognitive skills tapped by intelligence tests and required for educability, rather then in basic learning abilities, that culturally disadvantaged children differ most from typical middle-class children.

Associative Learning

Associative learning, as explained by Hall and Lindzey (1957, p. 540) is the "spatial and temporal linking of two events, usually accomplished by using paired-associate material. Such material may consist of a series of paired items in which one serves as a stimulus and the other a response. Paired-associate learning is learning to respond with the second item of a pair when the first is presented."

Jung (1968, p. 45) also said that associative learning refers to the correct pairing of stimuli and responses. He cited an everyday situation analogous to paired-associate learning as the acquisition of a foreign language vocabulary (p. 43). Learning of an association between the two members of one pair is somewhat independent of the associations to be formed for other pairs.

The literature does not contain many experiments relating to the use of paired-associate learning tasks as a means of discovering more about learning rates of normal elementary school children with different socioeconomic backgrounds, particularly among the whites. Experiments have been conducted comparing Blacks and whites, Blacks of both low- and middle-class, Mexican-American and Anglo-American, retarded and normal children, and Indians and whites.

In 1962, Hiner attempted to compare the associate learning rates of bright, normal, and retarded children. For this, she developed a set of pictures which she copyrighted as the Picture Paired Associate Learning Task. It is composed of sixteen pairs of pictures.

Hiner chose pictures rather than words for the paired associate task to avoid:

> (1) subject variation in the amount of time needed to recognize words; (2) the variation in reading ability among school children; (3) certain words that might arouse sufficient affect, thus inhibiting the learning process; (4) tasks that might arouse negative feelings if the subject had had unpleasant experiences in reading; and (5) words of one or more than one syllable in

> the same list that might present a variable in the difficulty of the learning lists (p. 11).
>
> Criteria for the pictures included:
>
> (1) the pictures must be simple outline drawings of common objects; (2) the words represented by the pictures must be one-syllable nouns; (3) the pictures must be immediately recognizable; (4) the pictures must be readily and consistently identifiable, that is, if a picture of a horse was sometimes called "pony" and sometimes "horse" the picture was eliminated; and (5) pictures must not be obviously potentially affect arousing, for example, a picture of a gun or of a snake. In order to insure immediate recognition and consistent identification, the pictures were shown to groups of seventy-five kindergarten children and to forty fourth-grade children. Pictures which did not meet the above criteria were eliminated (pp. 11-12).

Rohwer (1968) conducted a study to determine the reliability of a paired-associate task when used as a test of learning proficiency, and to assess the relationship between performance on such a task and on IQ tests as a function of grade level and socioeconomic status. His subjects represented kindergarten, first, and third grade students of both high and low socioeconomic status. He concluded that the reliability of the paired-associate task was acceptably high. The relationship between learning proficiency and intelligence varied with social class membership.

Although a paired-associate learning task seems to involve rote learning processes, Rohwer cited research demonstrations that efficient performance on paired-associate task activities decidedly was not rote in nature. If the subject created images to link the items of a pair, or if he formulated sentences that relate the items to one another, his performance

improved markedly. Rohwer also referred to studies indicating that performance on paired-associate tasks correlates substantially with long-term school learning as measured by grades or by scores on achievement tests.

Eisman (1958) tested superior, average, and retarded adolescents using a 7-card test. Her results suggest that IQ score alone is not a reliable predictor of learning. No significant differences among the groups were found with respect to learning or to retention and stimulus generalization.

Rohwer, Lynch, Levin, and Suzuki (1967) cited an experiment in which children in kindergarten, first, third, and sixth grades, half from lower and half from higher socioeconomic levels, were asked to learn twenty-four paired-associates. They reported that perhaps the most striking aspect of the results is that the children from the low strata schools learned with impressive proficiency, this in contrast to their classroom performance and their scores on standardized tests.

Purdy (1969) used the Hiner test to compare the learning rates of second, fourth, and sixth grade Indian and white children. He found that there were no statistically significant differences between the Indians and whites in learning the task at the second and fourth grade levels, although the Indians did learn with fewer trials and fewer errors. At the sixth grade level, the Indians learned the task with statistically significant fewer trials (at the .05 level) than did

the whites. Here again, the Indians learned with fewer errors, but the difference in total errors made is not statistically significant.

Prickett (1970), also using the Hiner test, compared second, fourth, and sixth grade Black and white children with a socioeconomic difference. His analysis of variance of the trials showed no significant difference caused by socioeconomic factors.

Cole (1971) used the Hiner test with Indian and white adolescents. She found no statistically significant difference in the number of trials and errors made by subjects from the two different groups. Therefore, she concluded, research stating that Indians are intellectually inferior is not supported.

The limited amount of research done in the area of paired-associate learning, particularly comparing white elementary school children of high and low socioeconomic status, suggests the appropriateness of this study done with white fifth-grade children of high and low socioeconomic levels.

CHAPTER II

STATEMENT OF THE PROBLEM

Research cited indicates that children from culturally and environmentally deprived groups do not tend to score as high on mental tests as do children of a more advantaged group. However, results of research done by Stevenson, Williams, and Coleman (1971) give little support to the principle of learning differences between the two groups in the operation of associative and cognitive learning abilities. Two types of tasks, both of which are described by the authors, were used for this investigation, namely, learning tasks and performance tasks. The subjects included fifty children in the four and five year age group of Black, white, and Indian parentage of different socioeconomic levels. The learning tasks involved paired-associates, serial memory, oddity learning, concept formation, observational learning, incidental learning, problem solving, and category sorting. Performance tasks included social imitation, persistence, reactivity, impulsivity, following instructions, variability, attention, and level of aspiration. The authors stated that, in general, the correlations obtained in the study are notable for their similarity rather than their differences.

According to Rohwer, Suzuki, and Ehri (1968) who presented paired-associate tasks to 240 children of lower and upper socioeconomic status in kindergarten, first, and third grades, under optimal conditions of learning, lower strata or culturally disadvantaged children six years of age and older are not inferior to upper strata children in basic paired-associate learning proficiency.

Paired-associate learning would appear to be basic to other and more complex learning such as concepts in arithmetic or the symbols that are combined to make words for spelling or reading.

Therefore, the problem in this study is to ascertain whether, in a comparative study, children from a low socioeconomic status will learn a 16-picture Paired Associate Learning Task as capably as will children from a high socioeconomic status when the two groups are matched for grade, race, and range of scores on a test of mental ability.

Two null hypotheses, one relative to trials-to-criterion scores, and one relative to error scores, were tested for statistical significance.

H_{O1}: There will be no statistically significant relationship between the number of trials-to-criterion required by subjects and their socioeconomic level in learning the 16-picture Paired Associate Learning Task.

H_{0_2}: There will be no statistically significant relationship between the number of errors made by subjects and their socioeconomic level in learning the 16-picture Paired Associate Learning Task.

The level of statistical significance required to support the hypotheses was set at 0.05.

Operational Definitions

Learning. A relatively permanent change in behavior brought about by reinforced practice.

Associate Learning. The spatial and temporal linking of two events.

Paired-Associate Material. Material used in learning consisting of pairs of items in which one item serves as a stimulus and the other as a response.

Stimulus Item. The first of two items presented to a subject in paired-associate material.

Response Item. The second of two items in a pair in paired-associate material. It is the response desired from the subject who has been presented the first item, the stimulus item.

Paired-Associate Learning. Learning to respond with the second item of a pair when the first item of paired associate material is presented.

Student Error. The result of the subject's failure to respond to a stimulus item within five seconds after presentation, or an incorrect response to a stimulus.

Student Trial. The result of the presentation and responses for all 16 pairs of the 16-picture Paired Associate Learning Task was considered as one trial regardless of the number of errors committed during that one complete presentation.

Trials to Criterion. The total number of trials required by a subject to achieve two successive correct repetitions of the 16-picture Paired Associate Learning Task.

Errors to Criterion. The total of all recorded errors of the subject during all the trials necessary to achieve the two successive correct repetitions of the 16-picture Paired Associate Learning Task.

Socioeconomic Status. A status of society as determined by the number of Title I students enrolled in schools in a given geographical area.

Low Socioeconomic Status. The category assigned to subjects of the schools with a high percentage of Title I students. The children were of families residing in low economic areas.

High Socioeconomic Status. The category assigned to the subjects attending a private school with no Title I students. The children were of families residing in the highest socioeconomic areas of the city.

Title I Students. Those students whose parents are in an economic classification which entitles the school which they attend to be paid extra funds for their education.

Major Assumptions

In consideration of this study, the following assumptions were made:

1. Associative learning is a legitimate area of study.
2. Associative learning can be measured.
3. Associative learning can be measured with the Hiner 16-picture Paired Associate Learning Task as the testing instrument.
4. The Hiner 16-picture Paired Associate Learning Task is an adequate instrument for measuring associative learning.
5. The range of intelligence selected is a legitimate category.
6. Intelligence can be measured with the Otis-Lennon Mental Ability Test, Elementary Level, Form J, being administered to fifth-grade students.
7. The fifth-grade students of the schools involved may be considered a normal population.
8. The sample of students may be considered of adequate size from which to generalize.

CHAPTER III

METHODS AND PROCEDURE

The Subjects

Subjects participating in this study included 62 white fifth-grade boys and girls, within an IQ range of 94-114, from schools in Oklahoma City, Oklahoma. Half of them were selected from a private school attended by children from high socioeconomic families. The other half represented low socioeconomic families residing in low socioeconomic areas whose children attended schools in their own communities.

Pre-experimental Procedure

A total of 154 white fifth-grade children were administered the Otis-Lennon Mental Ability Test, Elementary Level, Form J. The Otis-Lennon Mental Ability Test was chosen for use in this study because it could be administered as a group test to measure general mental ability and because it was standardized on samples from all types of school systems with varying socioeconomic characteristics. Included in the study were 62 students whose IQ fell within the range of 94-114.

The testing of the entire fifth-grade population, 73 children, of the high socioeconomic group was done by the

school principal. The author administered the same test to 81 boys and girls in three low socioeconomic area schools. These numbers included all fifth-grade students enrolled in normal classes who were judged to be white by the school principals on the basis of family history available to the schools.

Of the 73 high socioeconomic students, 42 were eliminated because of scores exceeding the stated range. No student scored below the acceptable range. From the 81 in the low socioeconomic group, 1 was eliminated because the score was above the stated range and 42 were eliminated because of scores falling below the range. Of the 38 remaining, 31 were chosen to be subjects. This was done by randomly selecting 31 of the score sheets which had been placed face down on a table before the administrator.

Testing Procedure

The test instrument used for this study was the Hiner 16-picture Paired Associate Learning Task. This test consists of two five-by-eight inch spiral-bound booklets. Booklet One, the Stimulus Set, contained 16 pairs, one pair to a page, of outline pictures of common objects: cat-bed (the sample pair), frog-broom, glass-dog, tent-brush, car-fork, fox-pig, chair-dress, leaf-house, comb-drum, hat-cup, bird-lamp, duck-saw, coat-sun, kite-fish, tree-shoe, bread-clock, and skate-ring. Booklet Two contained only the first picture of the Stimulus Set.

Each subject was tested individually in a room of the school away from general activity, thus eliminating all possible distractions. The examiner, who was the author in all instances, asked the child to sit at the end of a table at a right angle to her left.

For each subject, an individual check sheet was kept. All responses were recorded as + for a correct response or 0 for an incorrect response. Failure to make any response within the specified time limit was recorded as an incorrect response. The subject's name and school also were indicated on the record sheet.

The following instructions were given to each subject:

> Here are a number of cards (the examiner opens Booklet One). Each card in this set has two pictures on it (the examiner shows the subject the sample pair). Look at both pictures carefully and try to remember which two pictures go together. (The examiner then closes Booklet One and shows the subject Booklet Two). Then I will show you another set of cards like these with only the first picture showing (the examiner shows the sample card). I want you to tell me what picture went with this picture. (The examiner pauses for the answer.) So, as you see the two pictures together, try to remember what two pictures went together. Do you understand what you are to do?

If the subject failed to make the correct response for the sample cards, the examiner restated the instructions. Only twice for subjects in this study was that necessary, once for a subject of each socioeconomic group.

Following the explanation and sample trial, the paired pictures were presented to the subject at the rate of one every three seconds. Thereupon, Booklet One was closed, and

the single pictures within Booklet Two were presented at the rate of one every five seconds. The examiner recorded each oral response made by the subject. If no response was made during the five seconds, it was recorded as an incorrect response.

Additional trials were administered until the subject reached the criterion of two successive correct repetitions of the list. Intertrial intervals were ten seconds in length. Between trials, the examiner said, "Now we will look at the pictures again. Try to remember what two pictures were together."

If the subject questioned the examiner about the trials, the examiner added, "We will keep looking at the pairs of pictures until you learn all of them."

All testing, both the Otis-Lennon Mental Ability Test and the Paired Associate Learning Task, was completed within a period of two months.

CHAPTER IV

RESULTS

Thirty-one fifth-grade white children of low socioeconomic status and 31 fifth-grade white children of high socioeconomic status were tested in an effort to compare the rate of learning of the two different socioeconomic groups. The test used was the Hiner 16-picture Paired Associate Learning Task. The criterion of this test is two successive correct repetitions of the list. Comparisons were made on the number of trials required to meet the criterion of learning and on the number of errors committed in reaching this criterion. The required level for statistical significance was set at the 0.05 level.

The IQ scores of each group ranged from 94 to 114 as measured by the Otis Lennon Mental Ability Test, Elementary Level, Form J.

A chi-square test with Yates correction was used in the statistical analysis of the data to establish whether the variables of performance and socioeconomic status were related.

Trial and error scores were based on each subject's performance as recorded on individual record sheets. A subject was assumed to have learned the task when he could

successfully repeat the paired association twice in succession without error. For scoring purposes, if a subject repeated without error trials five and six, for example, he was given a trial score of five. An error score was recorded when a subject failed to give a correct response to the stimulus presented or if he failed to make any response within five seconds following the presentation of the stimulus.

Analysis of Trials in the Learning Task

The group of low socioeconomic subjects completed the task with a total of 234 trials, while the total number of trials required by the high socioeconomic subjects was 227.

Relative to trials, the hypothesis stated that there would be no statistically significant relationship between the number of trials to criterion made by subjects and their socioeconomic level. The number of trials required by each subject in both groups was arranged in a distribution and a median was computed. The median for the total distribution was 6.96. The subjects were then classified above or below the median number of trials within the groups defined by their socioeconomic level. The results are presented in Table 1.

The chi-square value was not statistically significant. The results will not allow the rejection of the null hypothesis of no relationship between trials to criterion and socioeconomic status.

TABLE 1

CHI-SQUARE ANALYSIS BETWEEN TRIALS-TO-CRITERION AND SOCIOECONOMIC STATUS

Subjects	N	Above Median	Below Median	df	x^2
Low Socioeconomic	31	14	17	1	.066
High Socioeconomic	31	12	19		

Analysis of Errors in the Learning Task

Subjects of the low socioeconomic groups made a total of 1377 errors while learning the test. A total of 1195 errors were committed by the high socioeconomic subjects.

Relative to errors, the hypothesis stated that there would be no statistically significant relationship between the number of errors to criterion made by subjects and their socioeconomic level. The number of errors made by each subject in both groups was arranged in a distribution and a median was computed. The median for the total distribution was 38. The subjects were then classified above or below the median number of errors within the groups defined by their socioeconomic level. The results are presented in Table 2.

The chi-square value was not statistically significant. The results will not allow the rejection of the null hypothesis of no relationship between the number of errors to criterion and socioeconomic status.

TABLE 2

CHI-SQUARE ANALYSIS BETWEEN ERRORS TO CRITERION AND SOCIOECONOMIC STATUS

Subjects	N	Above Median	Below Median	df	x^2
Low Socioeconomic	31	16	15	1	.0644
High Socioeconomic	31	14	17		

The point on the learning continuum at which the completion of the learning task occurred for each subject of each group is indicated in Table 3.

The mean number of trials to criterion required by the low socioeconomic subjects was 7.54. Of the 31 subjects tested, 18 completed the task in fewer than 7.54 trials, and 13 completed the task in more than the mean number of trials.

The mean number of trials to criterion required by the high socioeconomic subjects was 7.32. Within this group, 19 completed the task in fewer than 7.32 trials, and 12 required more than the mean number of trials.

The mean number of errors committed by the low socioeconomic subjects in reaching the criterion was 44.41. Of this group, 21 made fewer than 44.41 errors, and 10 committed more than 44.41 errors.

The mean number of errors committed by the high socioeconomic subjects in reaching the criterion was 38.54. Within this group, 15 made fewer than 38.54 errors and 16 committed more than 38.54 errors.

TABLE 3

THE COMPLETION OF THE LEARNING TASK TO THE NUMBER OF TRIALS

Trial number	Low Socioeconomic	High Socioeconomic
1		
2	1	
3		2
4	1	
5	7	2
6	5	8
7	4	7
8	4	3
9	4	5
10	1	1
11	1	1
12		2
13	1	
14		
15		
16	1	
17	1	
18		
19		
20		
Mean	7.54	7.32
Standard Deviation	3.26	2.14

The mean IQ score of the low socioeconomic group was 103.58. Of the 31 subjects tested, the IQ score of 17 fell below the mean while 13 scored above the mean.

The mean IQ score of the high socioeconomic group was 106.58. Of the 31 subjects tested, the IQ score of 11 fell below the mean while 20 scored above the mean.

CHAPTER V

DISCUSSION AND SUMMARY

Heredity versus environment has been debatable since Binet presented his instrument for measuring intelligence, and it remains a current argument. As such, it is ripe with implications relative to one's socioeconomic status and how well he scores on tests of intelligence.

Researchers are cognizant of the fact that more often than not the child of a low socioeconomic family will score lower on a given IQ test than will his age-mate from a high socioeconomic family. They question, however, if such a score earned on the intelligence test by the low status child is a true picture of his ability to learn or, rather, just proof of the fact that he is environmentally deprived to the extent that he is not familiar with the kind of information which the test items attempt to elicit from a subject. By the same token, the disadvantaged child fails to match the standards of his classmates from a higher socioeconomic level on achievement tests.

The present investigation was undertaken to ascertain if, on a learning task not predicated on an advantaged environment or on prior learning, the disadvantaged white child would

evidence an ability to learn equal to that of the advantaged white child. The learning task used was the Hiner 16-picture Paired Associate Learning Task.

Sixty-two white fifth-grade boys and girls, half of a low socioeconomic status and half of a high socioeconomic status, were selected as Subjects from a total of 154 children who were administered the Otis-Lennon Mental Ability Test, Elementary Level, Form J. The IQ of those chosen to participate in the study fell between 94 and 114.

It was hypothesized that in learning the 16-picture Paired Associate Learning Task there would be no statistically significant relationship between the number of trials to criterion and socioeconomic level nor would there be any statistically significant relationship between errors committed and socioeconomic level. The level of statistical significance required to support the hypotheses was set at 0.05.

The hypothesis relative to the number of trials that would be required was not supported. The results failed to indicate a relationship between the number of trials to criterion required by the subjects and their socioeconomic status. The mean number of trials needed by the low socioeconomic subjects was 7.54 and the mean number of trials required by the high socioeconomic subjects was 7.32.

The hypothesis concerning the number of errors that would be committed was not supported. The results failed to indicate a significant relationship between the number of

errors made by the subjects and their socioeconomic status. The mean number of errors made by the low socioeconomic subjects was 44.41, and the mean number of errors committed by the high socioeconomic subjects was 38.54.

Comparing individual's number of trials to the mean number of trials, it can be observed that the low socioeconomic groups whose mean number of trials was 7.54 had 18 subjects who required fewer than 7.54 trials while 13 required more. The mean number of trials for the high socioeconomic group was 7.32, and 19 subjects required fewer trials while 12 required more. Comparing each subject's number of trials to the median of 6.96 for the total distribution, it is noted that the low socioeconomic group had 14 above the median and 17 below, whereas the high socioeconomic group had 12 above the median and 19 below.

Making the same type of comparisons with the number of errors committed, it is seen that the mean number of errors committed by the low socioeconomic group was 44.4, but 21 subjects made fewer errors while 10 subjects made more. The mean number of errors committed by the high socioeconomic group was 38.54, but 15 made fewer errors while 16 made more errors. The median number of errors for the total distribution was 38. Within the low socioeconomic group, 16 were above the median and 15 below. For the high socioeconomic group, 14 were above the median and 17 fell below.

The Raw Score tables in the Appendix reveal that no high socioeconomic subject committed more than 77 errors. For the low socioeconomic subjects the table indicates that two subjects made 116 and 120 errors, respectively, numbers which greatly exceed the next highest of 88. These two subjects also required more trials than did any other subject of either group.

The subject who committed 116 errors appeared to be concerned about the time. The test was begun at 2 p.m. She glanced at the clock after every trial, and also after each stimulus was presented for the last seven trials. The author would suggest that no tests of this nature should be administered after such time in the afternoon that a child begins thinking about the school day being over or about the bus that must not be missed.

It would seem fair to conclude that socioeconomic status cannot be considered a factor in the learning of paired associates by a white child who falls within a normal IQ range. As stated by Rosenthal and Jacobson (1968), the disadvantaged child's academic problems may originate not in his different ethnic, cultural and economic background, but in his teacher's reaction to that background. The authors refer to the self-fulfilling prophecy and the fact that a person's behavior tends to be what is predicted for him.

To the degree that intelligence can be defined as the ability to learn, it appears that a child of low socioeconomic

background is as capable and has the same potential as does his age-mate of a higher socioeconomic background.

Implication for Further Research

For a slightly different study, it might be possible to secure the subjects by randomly sampling the students in a given grade level from each of the two socioeconomic levels, excluding the mentally retarded of either group, rather than selecting and categorizing the subjects within a particular range of IQ scores.

Another approach to a research problem, similar to the one presented herein, that might be revealing as to the learning ability of children from low and high socioeconomic families would be to compare the paired-associative learning rates of subjects from the low socioeconomic level having average IQ's (90-110) with subjects from the high socioeconomic level whose IQ's are above 110. If there were no statistical differences in the learning rates, it might be assumed that there is no innate difference in the ability to learn even though the high socioeconomic subjects usually present higher IQ's.

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APPENDIX

TABLE 4

RAW SCORES

Low Socioeconomic Status Subjects

Subject	IQ Score	Trials	Errors
1	114	2	4
2	109	4	24
3	100	5	12
4	106	5	24
5	101	5	25
6	94	5	25
7	102	5	33
8	100	5	33
9	98	5	36
10	112	6	28
11	106	6	31
12	102	6	31
13	98	6	37
14	114	6	38
15	108	7	36
16	96	7	43
17	103	7	44
18	100	7	44
19	103	8	34
20	110	8	36
21	94	8	44
22	109	8	48
23	113	9	54
24	105	9	55
25	97	9	55
26	105	9	56
27	97	10	55
28	114	11	68
29	95	13	88
30	110	16	120
31	96	17	116
Mean	103.58	7.54	44.41
Standard Deviation	6.41	3.26	25.46

TABLE 5

RAW SCORES

High Socioeconomic Status Subjects

Subject	IQ Score	Trials	Errors
1	109	3	12
2	99	3	18
3	114	5	25
4	109	5	29
5	107	6	18
6	100	6	19
7	106	6	24
8	107	6	26
9	111	6	29
10	113	6	31
11	112	6	38
12	111	6	42
13	111	7	32
14	94	7	34
15	107	7	35
16	107	7	39
17	99	7	40
18	112	7	42
19	99	7	49
20	114	8	30
21	114	8	46
22	101	8	55
23	106	9	40
24	105	9	42
25	97	9	46
26	99	9	49
27	111	9	65
28	107	10	45
29	107	11	50
30	108	12	68
31	108	12	77
Mean	106.58	7.32	38.54
Standard Deviation	4.53	2.14	14.74