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GRADUATE COLLEGE

VISUAL-MOTOR SKILLS AND BODY STRENGTH OF DISADVANTAGED CHILDREN

A DISSERTATION

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BY

COKER JACK DENTON

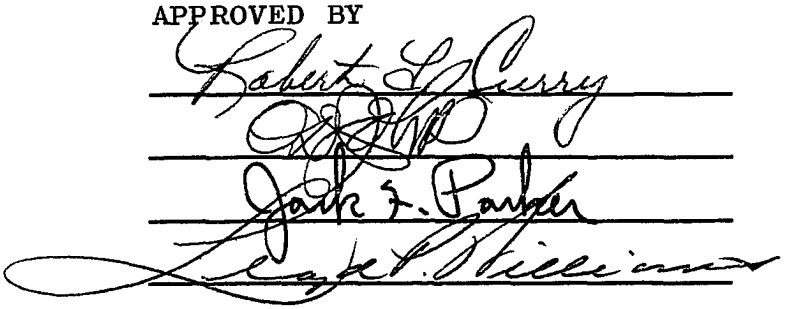
Norman, Oklahoma

1968

VISUAL-MOTOR SKILLS AND BODY STRENGTH

OF DISADVANTAGED CHILDREN

APPROVED BY



DISSERTATION COMMITTEE

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VISUAL-MOTOR SKILLS AND BODY STRENGTH OF DISADVANTAGED CHILDREN

CHAPTER I

INTRODUCTION

Researchers are gathering information about the child from the disadvantaged socioeconomic background, and many reasons have been presented as to why the disadvantaged child does not achieve as successfully in school as the non-disadvantaged. Among the reasons given in the literature, inadequate motivation and lack of an "educational tradition" seem to stand out.

Havighurst characterized the disadvantaged child as having (a) family characteristics resulting from living in homes in which language facilities and experiences are limited, (b) personal characteristics resulting in insecurity because of the inability to meet the demands of school and other social institutions, and (c) social characteristics of the low income, rural background, or social and economic discrimination.[1]

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[1]Robert J. Havighurst, "Who are the Socially Disadvantaged?" Journal of Negro Education, XXXIII (Summer, 1964), pp. 212-215.

Riessman described the disadvantaged as having a culture of their own which is different from the middle-class culture. He defined the term "culturally deprived" in reference to those aspects of middle-class culture--education, books, formal language--of which the so-called disadvantaged have not benefited.[2]

Riessman listed the following reasons why underprivileged children do not achieve in school:[3]

1. The lack of an "educational tradition."
2. Insufficient development of the language pattern.
3. Inadequate motivation.

The deprived child has been described by Riessman as coming from a background of poverty and having a lack of corrective action in the home. An interesting observation about Riessman's description of the deprived child is his statement concerning the child's great respect for physical prowess and physical science, and the superiority of his physical or motoric over his word-style problem solving techniques.[4]

Characteristically, the child from the disadvantaged background does not perform as well as the nondisadvantaged

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[2]Frank Riessman, The Culturally Deprived Child, (New York: Harper and Bros., 1962), p. 3.

[3]Ibid., pp. 4-5.

[4]Patrick J. Groff, "Culturally Deprived Children: Opinions of Teachers on the Views of Riessman," Exceptional Children, XXXI (October, 1964), pp. 62-63.

on intelligence tests or other academic achievement tests when verbal and temporal skills are involved. His physical skill exceeds his verbal skill and he tends to think in spatial rather than temporal terms.[5]

The literature tended to indicate that the disadvantaged child is superior in physical problem solving skills when this area is compared to performance in other problem solving skills; however, there is little indication as to how he compares to the nondisadvantaged in these skills.

The purpose of this study was to compare a selected sample of kindergarten children from disadvantaged socioeconomic backgrounds with a selected sample of kindergarten children from nondisadvantaged socioeconomic backgrounds in the areas of body strength and flexibility, and perceptual development as measured by a test involving eye-hand motor skills. The information derived from this study may be of value in creating more meaningful experiences for disadvantaged children in the school environment.

The Problem and Definitions of Terms Used

Information is needed about the child from the disadvantaged environment if meaningful school experiences are to be provided for him. Only through an understanding

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[5] Ibid.

of the child's abilities, capabilities, and limitations can his potential be developed.

The literature revealed that the disadvantaged child has personal and social characteristics which limit his functioning in the middle class society. Groff indicated that the disadvantaged child does not perform as well on intelligence and achievement tests as the balance of the population, that he tends to think in spatial rather than temporal terms, and that his physical skill exceeds his verbal skill.[6]

In an effort to gain insight into the learning disabilities of children, researchers are studying the developmental pattern of visual-motor skills and gross-motor skills. Information about the physical developmental pattern of the child is utilized in selecting and developing school experiences.

Current periodicals contain a number of articles treating visual-motor and gross-motor development and their relationship to learning disabilities. Many of these articles point to a definite relationship between learning disabilities and the lack of development of certain visual-motor skills.

The literature on child development indicates that gross-motor development precedes fine-motor development, and that body strength is an indicator of body maturity. It

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[6]Patrick J. Groff, loc. cit.

thus may be reasonable to assume that children who perform well on tests involving body strength and flexibility may also perform well on tests involving visual-motor skills where the motor skills involved are those of fine-motor--that of tracing or outlining with pencil or crayon.

Statement of the Problem

The purpose of this study was to determine whether children from disadvantaged socioeconomic backgrounds perform as well as children from nondisadvantaged socioeconomic backgrounds on tests of visual-motor skills and tests of body strength and flexibility.

Hypotheses

Hypothesis 1 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of children from disadvantaged socioeconomic backgrounds and the performance of children from nondisadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination
b. Figure-ground
c. Constancy of Shapes
d. Position in Space
e. Spatial Relationships
f. The Composite Score.

Hypothesis 2 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of boys from disadvantaged socioeconomic backgrounds and the performance of girls from disadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination

b. Figure-ground

c. Constancy of Shape

d. Position in Space

e. Spatial Relationships

f. The Composite Score

Hypothesis 3 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of boys from nondisadvantaged socioeconomic backgrounds and the performance of girls from nondisadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination

b. Figure-ground

c. Constancy of Shape

d. Position in Space

e. Spatial Relationships

f. The Composite Score

Hypothesis 4 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of boys from disadvantaged socioeconomic backgrounds and boys from nondisadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination

b. Figure-ground

c. Constancy of Shape

d. Position in Space

e. Spatial Relationships

f. The Composite Score

Hypothesis 5 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of girls from disadvantaged socioeconomic backgrounds and the performance of girls from nondisadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination

b. Figure-ground

c. Constancy of Shape

d. Position in Space

e. Spatial Relationships

f. The Composite Score

Hypothesis 6 - There will be no significant difference, operationally defined as the .05 confidence level,

in the performance of children from disadvantaged socio-economic backgrounds and the performance of children from nondisadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

Hypothesis 7 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of boys from disadvantaged socioeconomic backgrounds and the performance of girls from disadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

Hypothesis 8 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of boys from nondisadvantaged

socioeconomic backgrounds and the performance of girls from nondisadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

Hypothesis 9 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of boys from disadvantaged socioeconomic backgrounds and the performance of boys from nondisadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

Hypothesis 10 - There will be no significant difference, operationally defined as the .05 confidence level, in the performance of girls from disadvantaged socioeconomic backgrounds and the performance of girls from nondisadvantaged

socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

Definition of Terms

Socioeconomic background. Weighted factors of employment, education, dwelling area, and house type.

Disadvantaged. Those children from families whose index rating for the socioeconomic factors of employment, dwelling area, education, and house type is twenty or greater as measured by the socioeconomic rating scale developed by Warner, Eels, Havighurst and Tyler.[7]

Nondisadvantaged. Those children from families whose index rating for the socioeconomic factors of employment, dwelling area, education, and house type is less than twenty as measured by the socioeconomic rating scale developed by Warner, Eels, Havighurst and Tyler.

Visual-motor skills. The perceptual-motor skills involved in understanding symbolic representations on a

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[7]Kenneth Eels et al., Intelligence and Cultural Differences (Chicago: The University of Chicago Press, 1951), p. 91.

printed page. Specifically those skills measured by the Frostig Developmental Test of Visual Perception.

1. Eye-motor coordination
2. Figure-ground
3. Constancy of shape
4. Position in space
5. Spatial relationships

Body strength and flexibility. The physical development of specific large muscle control as measured by the six test items of the Kraus-Weber Test of Muscular Strength and Flexibility.

1. Abdominal and psoas strength
2. Further test for abdominal strength
3. Psoas and lower abdominal strength
4. Upper back muscles
5. Lower back muscles
6. Length of back and hamstring muscles

Basic Assumptions

In conducting research in the social areas it is often necessary to make certain assumptions before initiating the investigation. The following basic assumptions are made for this study:

1. That cultural environment does affect the physical development of children.

2. That the culturally disadvantaged child can be identified by the characteristics stated in the socioeconomic rating scale.
3. That the development of perceptual skills is basic to learning to read.
4. That the evaluative instruments, the Frostig Developmental Test of Visual Perception and the Kraus-Weber Test of Muscular Strength and Flexibility are valid and reliable as to the factors they purport to assess.

Limitations of the Study

There were four limiting factors which entered into the study which could have had some bearing upon the results.

The first factor is that only children from Wichita, Kansas, kindergarten classes were included in the study, and the conclusions apply only to this population.

A second factor is that the study was limited to only two instruments: The Frostig Developmental Test of Visual Perception and the Kraus-Weber Test of Muscular Strength and Flexibility.

A third and important factor is that many of the very lowest of the socioeconomic disadvantaged children could not be used in the study because they had been in

headstart, and the children of the nondisadvantaged group had not had headstart experience.

The fourth limiting factor was that children from the lower socioeconomic classes were not as responsive to the directions for administering the tests as the children from the upper socioeconomic classes.

Importance of the Study

The children from the culturally disadvantaged backgrounds are worthy of study and attention, for they have talents to be discovered and cultivated. As Riessman has said, ". . . the goal is to provide teachers and others with accurate information that will enable them to work fruitfully with these children."[8] The results of this study should be of value to school personnel who plan primary grade experiences and headstart programs for the culturally disadvantaged.

Organization of the Study

This study consists of five chapters. Chapter I presents the background and need for the study, the statement of the problem, limitations, assumptions, definitions, and hypotheses.

Chapter II presents the review of the literature related to child development, perceptual development and

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[8]Riessman, op. cit., xiii.

perceptual testing, physical fitness and its relationship to other areas, characteristics and identification of the culturally disadvantaged child, and studies involving the perceptual and physical aspects of the disadvantaged child. Sex difference in reading is also reviewed.

Chapter III gives a description of the design of the study. A discussion of the selection of the subjects and the evaluative instruments used is also provided.

Chapter IV presents the data. A discussion of the statistical tests of significance used is also provided.

Chapter V summarizes the findings of the investigation. Recommendations for further research are included.

CHAPTER II

REVIEW OF THE LITERATURE

The literature and research was reviewed in the following areas: child development, perceptual development and perceptual testing, physical fitness and relationship to other areas, characteristics and identification of the socio-economic disadvantaged child, sex differences in reading, and studies involving the perceptual and physical aspects of the disadvantaged.

A. Literature on Child Development

The literature has been reviewed from the viewpoint of child development as it relates to the development of gross-motor skills, fine-motor skills, and visual perception. The review of the literature documents the sequential developmental pattern of the growth of the child as it proceeds from gross-motor development to the development of fine-motor skills. The objective of the review was to determine the relationship of the maturation level of the gross-motor skills to the child's performance on a visual-motor skills test that employs the use of fine-motor skills.

The literature reviewed on child development indicated that maturity of the child begins with the gross-motor skills. The child matures from the head through the torso, to the arms and legs, and, last of all, the fine-motor skills of the fingers. Breckenridge has made the following observation about the sequential developmental pattern of babies:

> In general, control proceeds from control of the whole body to control of the various parts, from the less well-differentiated to the finer movements. It also proceeds from head and neck through the torso and into control of arms and legs. . .[1]

There is general agreement that the maturing child can be expected to accomplish certain acts of motor-skill development at certain age-ranges, with maturation the dominant factor, and that practice has little effect if it precedes maturation. This is substantiated in the following statement by Garrison:

> Although research is not available to furnish guidance for all learning, there is ample evidence that certain motor skills, such as walking, using the spoon in eating, hopping, skipping and the like, appear according to a sequential order of development.[2]

Garrison has also documented the role of maturation in the physical development of the child:

> Thus maturation, general motor activities performed daily, and practice at the appropriate

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[1]Marian E. Breckenridge and E. Lee Vincent, Child Development, 4th ed; (Philadelphia: W. B. Saunders Co., 1961), p. 230.

[2]Karl C. Garrison, Growth and Development (New York: Longmans, Green and Co., 1952), p. 145.

> time provide the basis for growth in motor skills. The results of studies lead to the generalization that training cannot transcend maturation.[3]

Ilg and Ames have also pointed out that growth has an orderly way, and, that if internal or external influences cause the skipping or mixing of stages of growth, the effect may be disruptive on the child.[4]

Idal has also stressed the necessity of physical maturation as an essential factor in learning. If effective learning is to occur, the individual must gain control of his body.[5]

The importance of the orderly development of gross-motor skills to the development of the fine-motor skills has also been discussed by De Hirsch. She has referred to the writings of such prominent researchers as Piaget, Gesell, Werner, and Vygotsky to support her viewpoint.[6]

Motor skill development has been regarded for some time as an indicator of maturation level. The functioning of hand-and-eye has been tested in such well-known intelligence tests as the Kuhlman-Binet Test and the Stanford-Binet

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[3] Ibid., p. 144.

[4] Frances L. Ilg and Louise Bates Ames, School Readiness: Behavior Tests Used at the Gesell Institute (New York: Harper and Row, 1965) p. 64.

[5] Paul E. Idal, "Elementary Physical Education in Kansas," The Kansas Elementary School Principal, IV (Fall, 1961), p. 11.

[6] Katrina De Hirsch, Jeannette Jefferson Jansky, William S. Langford, Predicting Reading Failure: A Preliminary Study of Reading, Writing, and Spelling Disabilities in Pre-school Children (New York: Harper and Row, 1966), p. 13.

Intelligence Scale. The developmental studies of Gesell included motor-skills which emphasized hand-eye coordination.[7]

Motor skills are complex and being somehow related to perception and intelligence, seem to relate to almost every aspect of the child's psychological status, to the previous learning in his environment background, and to his present motivation. Motor skills may be related to emotional stability and to the social relationships of the individual.

The review of the literature on child development has established three important facts: one, that the maturity of the child begins with gross-motor development and proceeds to fine-motor development; two, that the maturing child can be expected to accomplish acts of motor-skill development at certain age-ranges, and that maturation is the dominant factor with practice having little effect if it precedes maturation; three, that motor-skill development has been regarded for sometime as an indicator of maturation level.

B. Perceptual Development and Perceptual Testing

The literature pertaining to the research on perceptual development and perceptual testing revealed a number of interesting studies.

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[7]L. M. Jenkins, "A Comparative Study of Motor Achievement of Children, Five, Six, and Seven Years of Age," Teachers College, Columbia University, Contributions to Education, No. 414, 1930.

Vernon has reviewed the research pertaining to visual perception in children. She has commented on a study by Gellerman in which he studied perception in children of a very young age:

> Thus L. W. Gellerman found that children of two can discriminate between simple shapes such as a square, a circle, and a triangle. But, J. Piaget and B. Inhelder showed that children could not copy such shapes correctly till they were four or five years old. And according to L. Wood and E. Shulman these and slightly more complex shapes were not remembered correctly until nearly eight years of age.

Vernon summarized the research she had reviewed:

> It may appear at first sight that these inaccuracies in perception would constitute a considerable handicap to the child learning to read; and probably they do make reading more difficult. But in point of fact, most of them seem to die out naturally as the child matures, and to become relatively unimportant at about seven years of age.[8]

Coleman reported a study by Townsend in which a rapid and regular increase in the ability to copy forms between the mental ages of five to seven years was found. After that, various individual factors seem to influence the copying.[9] He also stated that Townsend came to the conclusion that copying is largely a function of perceptual ability, rather than a function of motor skills.[10] However,

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[8] M. D. Vernon, "Development of Visual Perception in Children," Education, 78 (May, 1958), pp. 547-549.

[9] James C. Coleman, "Perceptual Retardation in Reading Disability Cases," The Journal of Educational Psychology, 44 (December, 1953), pp. 497-503.

[10] Ibid., p. 497.

Vernon, commenting on the same study, suggested that the errors in copying may have been due to inability to draw correctly rather than the inability to perceive the shapes correctly.[11]

Lachman found also that age differences contributed significantly to the presence of the distortions found in administering the Bender Gestalt test: the younger children made the greater number of distortions.[12]

One of the more recent studies reflecting performance and maturity is that of Ilg and Ames. Ilg and Ames studied approximately 120 children during the period of September 1957 to June 1960. There were sixty-nine kindergarten children, twenty-one first-grade children, and thirty-one second-grade children. Using the Gesell Developmental Test, a battery of visual tests and two projective tests--the Rorscharch and the Lowenfield Mosaic Test, the investigators attempted to determine each child's readiness to be either starting school or to be in the grade to which they were assigned. They concluded that approximately fifty per cent

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[11]M. D. Vernon, Backwardness in Reading (Cambridge: The University Press, 1957), p. 13.

[12]Frank M. Lachmann, "Perceptual-motor Development in Children Retarded in Reading Ability," Journal of Consulting Psychology, 24 (1960), p. 427.

of school age children may be either unready or questionably ready for the grade where chronological age places them.[13]

Girls reflected more maturity than boys, and the Gesell Institute recommended that the age for starting girls should be September the first when they are fully six years old, and that boys would do better if they were fully six and one-half years of age.[14]

Schubert stated that a number of investigations have revealed that many six and seven year old children are not visually ready for reading. He also indicated that the majority of first-grade children who are not visually ready to read as six year olds are usually ready by the beginning of second grade. He sees this as solely a maturation function and credited lack of visual acuity as a chief cause of reading failures.[15]

Another recent study is that of De Hirsch, Jansky, and Langford. These early childhood education writers are in the process of developing a predictive index to assess children's maturation level and readiness for school. They worked with a sample of fifty-three children of kindergarten

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[13]Francis L. Ilg, Louise B. Ames, and Richard J. Apell, "School Readiness as Evaluated by Gesell Developmental, Visual, and Projective Tests," Genetic Psychology Monographs, 71 (1965), pp. 61-91.

[14]Ibid.

[15]Delwyn G. Schubert,"Visual Immaturity and Reading Difficulty," Elementary English, 34 (May, 1957), pp. 323-325.

age from a predominantly lower-middle class background. The children were given an extensive battery of tests in motility patterning, gross-motor patterning, auditory-perceptual patterning, receptive-language tests, expressive-language tests, sentence development, style (method of attacking a task), and a summarized profile. The children were tested again at the end of grade one and grade two. The kindergarten tests were correlated to the end of second grade tests to determine which factors might have been predictive of success. De Hirsch and her associates chose an index consisting of the ten most promising tests: a pencil test (fine-motor patterning), Bender Viso Motor Gestalt (visual-perceptual patterning), Wepman Auditory Discrimination Test (auditory-perceptual patterning), number of words in a story (expressive-language patterning), categories (sentence development), Horst Reversals Test (reading tests), Gates Word Matching Test, Word Recognition I and II, and Word Reproduction, (all reading readiness).[16] Actually the researchers used a total of thirty-seven subtests. The ones finally chosen represented a group of ten that had the highest correlation to school achievement as measured by the end-of-second grade test.

The gross-motor patterning tests of balance, hopping, and throwing had a very low correlation to the achievement

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[16]De Hirsch, Jansky, and Langford, op. cit., p. 41.

tests in the study by De Hirsch. The fine-motor patterning of use of the pencil had a high correlation, while the other two subtests of pegboard speed and tying a knot had a very low correlation. The Bender Viso Motor Gestalt was listed under visual-perceptual patterning and produced one of the higher correlations.[17]

The literature pertaining to the research on perceptual development and perceptual testing tended to substantiate the evidence presented in the review of the literature on child development. The important ideas are threefold: one, maturity is an important factor in the performance of children on perceptual tests; two, chronological age does not always reflect the actual maturity; three, girls tend to mature more quickly than boys.

C. Physical Fitness and Correlation to Other Areas

The literature tended to indicate that the ability to use one's body affects daily living and success or lack of success in life. Another important idea revealed by the review of the literature is that environment may contribute to a child's physical development.

The literature has indicated that children are a product of their environment and this seems to be as true for physical performance as it is for other areas. Kraus

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[17] Ibid., p. 94.

has pointed this out in his study of American and European children in which 57.9 per cent of the American children failed his muscular and flexibility tests and less than 10 per cent of the European children failed.[18]

Fleishman has also mentioned the cultural differences: ". . . properly designed studies can exploit the fact of cultural differences and may throw considerable light on such important questions."[19]

Ponthieux and Barker studied the relationship between socioeconomic status and physical fitness factors. They concluded that one socioeconomic group was not more physically fit than any other group in all the components of fitness. There were indications, however, that lower-status girls and boys were faster (50-yard dash) and better co-ordinated (softball throw) than the upper-status boys and girls. The upper-status children surpassed the lower-status children in arm and shoulder girdle strength (pull-ups) and in abdominal and hip flexor muscles (sit-ups). Ponthieux and Barker did not attempt to explain causes but only to identify conditions.[20]

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[18]Hans Kraus, Ruth P. Hirschland, "Minimum Muscular Fitness Tests in School Children," Research Quarterly, XXV (1954), pp. 178-188.

[19]Edwin A. Fleishman, The Structure and Measurement of Physical Fitness (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), pp. 111-117.

[20]N. A. Ponthieux and D. G. Barker, "Relationship Between Socioeconomic Status and Physical Fitness Measures," Research Quarterly, 36 (December, 1965), pp. 464-467.

Hart and Shay conducted a study on the relationship between physical fitness and academic success. Although they did not find a significant relationship in their study, they reported in their review of the literature a number of studies indicating a consistent positive relationship between physical fitness and achievement. These studies were conducted on junior high, senior high school, and college students.[21]

Rarick and Oyster attempted to establish a relationship between skeletal age and other maturity indicators to measures of strength and motor performance of second grade boys. They concluded that skeletal maturity was a factor of little consequence in explaining individual differences in strength and motor proficiency. The factors of chronological age, height, and weight, (also considered to be maturity factors), were correlated to strength and motor performance variables. While no single factor correlated significantly to strength and motor performance measures, the proper weighting of the maturity variables in multiple correlations accounted for as much as 65 per cent of the variance in strength measured in their study.[22]

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[21]Marcia E. Hart and Clayton T. Shay, "Relationship Between Fitness and Academic Success," Research Quarterly, 35 (December, 1964), pp. 523-531.

[22]G. Lawrence Rarick, Nancy Oyster, "Physical Maturity, Muscular Strength, and Motor Performance of Young School-Age Boys," Research Quarterly, 35 (December, 1964), pp. 523-531.

Rarick and Oyster indicated that strength correlates higher with the factors of maturity than the complex skills of running, jumping, and throwing which entail learning and practice.[23] This supports the basic premise of this proposal that tests of strength correlate with maturity factors.

Another study that demonstrated the relationship between scholastic achievement and strength is that of Clarke and Jarman. These two researchers used two groups, grouped on the basis of performance on three strength and two growth measures at each age of 9, 12, and 15 years. The two groups were equated on intelligence. The academic achievement of the two groups was compared, and the high-performance group on the strength index had the higher achievement means.[24]

Auxter compared the performance of mentally retarded boys on tests of strength and flexibility. On the basis of neurological examinations, EEG findings, and supportive life histories he classified the boys as non-brain-damaged, brain-damaged, and undifferentiated. The non-brain damaged group was superior to both the brain-damaged and undifferentiated groups on the vertical jump.[25]

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[23] Ibid., p. 526.

[24] H. Harrison Clarke, Boyd O. Jarman, "Scholastic Achievement of Boys, 9, 12, and 15 Years of Age as Related to Various Strength and Growth Measures," Research Quarterly, 32 (May, 1961), pp. 155-161.

[25] David M. Auxter, "Strength and Flexibility of Differentially Diagnosed Educable Mentally Retarded Boys," Research Quarterly, 37 (December, 1966), pp. 455-461.

These studies tend to support the statement of Garrison that strength is a good indicator of maturity.[26]

There are three important ideas documented in the review of the literature pertaining to physical abilities and its correlation to other areas: one, that there is a positive relationship between environment and physical abilities; two, that strength is generally regarded as a good indicator of maturity level; three, that there does seem to be a correlation between physical ability and general achievement.

D. Characteristics and Identification of the Disadvantaged

Havighurst has described the disadvantaged child as having (a) family characteristics resulting from living in homes in which language facilities and experiences are limited, (b) personal characteristics resulting in insecurity because of the inability to meet the demands of school and other social institutions, and (c) social characteristics of the low income, rural background, or social and economic discrimination.[27]

Riessman has characterized the disadvantaged as having a culture of their own which is different from the middle-class culture. He defined the term "culturally deprived" in reference to those aspects of middle-class

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[26]Karl C. Garrison, Growth and Development, (New York: Longmans, Green and Co., 1952), pp. 136, 149.

[27]Havighurst, op. cit., p. 893.

culture--education, books, formal language--from which the disadvantaged have not benefited. He indicated that the lack of "educational tradition," insufficient development of the accepted language pattern, and inadequate motivation are the major reasons that the disadvantaged child does not achieve in school.[28]

Bereiter found that disadvantaged preschool children are especially retarded in language development and reasoning ability or logical development. He asserted that the amount of retardation is typically a year or more.[29]

Bereiter also pointed out that the disadvantaged children typically score five to fifteen points below average on general intelligence tests, but that these scores should be regarded only as an indicator of how much a child has learned that is relevant to success in school as compared to other children of his own age.[30]

Bereiter stated that the major factors of academic achievement are verbal and reasoning abilities, and that verbal and reasoning abilities can be combined into the ability to manipulate symbols. Therefore, he contended that

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[28]Riessman, op. cit., pp. 3-5.

[29]Carl Berieter, Siegfried Englemann, Teaching Disadvantaged Children in the Preschool (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966), p. 4.

[30]Ibid.,p. 5.

the disadvantaged children are retarded most in the areas that count the most.[31]

He further noted that disadvantaged children show little or no retardation in the ability to master specific rote-learning tasks or immediate memory span. Performance on these items does not rely on previously learned concepts the way performance on language and reasoning tests does.[32]

Riessman indicated that the disadvantaged child shows superiority in the area of physical or motoric problem solving techniques when compared to his word-style problem solving techniques.[33] Both Bereiter and Riessman tended to agree that the disadvantaged child is lacking in learning, not the fundamental capacity to learn.

In summary, there seems to be general agreement that the disadvantaged child has certain identifiable characteristics. In terms of middle-class society he has limited language facilities, the social characteristics of the low income, rural background, and lacks an educational tradition. In terms of the school, he has an insufficient language pattern, an Intelligence Quotient five to fifteen points below average, and an inability to manipulate symbols. His physical abilities are generally regarded to be superior

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[31] Ibid., p. 5.

[32] Ibid., pp. 4-5.

[33] Riessman, op. cit., p. 3.

to his verbal and reasoning abilities. There is general agreement, however, that the child is lacking in learning, rather than the capacity to learn.

E. Sex Differences in Reading

The literature on sex differences in reading has been reviewed because of the general inability of young boys to compete successfully with young girls. Girls tend to mature earlier than boys in many aspects of growth. Girls tend to reach puberty about one and a half years earlier than boys, tend to cut teeth earlier, talk earlier, and have larger vocabularies than boys.[34]

Harris has noted that boys constitute about two-thirds of the milder reading disability cases and make up seventy-five to ninety per cent of the severe reading cases.[35] The inference can be drawn that fewer boys than girls are ready for reading instruction when they enter school.

This viewpoint is supported by Ilg and Ames when they recommend that the age for starting girls in school should be September 1 when they are fully six years of age, and boys would do better if they were fully six and one-half years of age.[36]

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[34]Albert J. Harris, How to Increase Reading Ability (4th ed; New York: David McKay Company, Inc., 1961), p. 27.

[35]Harris, loc. cit., p. 28.

[36]Ilg, loc. cit., pp. 61-91.

Further evidence supporting the factor of maturity in school achievement of first grade children was presented by Harris. He referred to an experimental study by Morphett and Washburne in 1931 in which the progress of first grade children in Winnetka, Illinois, was studied in relation to their mental ages. Two important points were reported: children who entered school with mental ages below six usually failed; as the mental age increased the percentage of failures decreased.[37]

St.John conducted a longitudinal study spanning four years. He reported that girls exceeded boys in reading at grades one through four although there was no significant difference in the measured intelligence of the one thousand boys and girls involved in the study.[38]

Stroud and Lindquist conducted a study of 50,000 pupils in grades three through eight in the Iowa schools. They reported a consistent and significant superiority of the girls over the boys with the largest differences at grades three and four. The differences declined significantly at grade six.[39]

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[37]Harris, loc. cit., p. 28.

[38]Charles W. St. John, "The Maladjustment of Boys in Certain Elementary Grades," Education Administration and Supervision, XVIII (1932), pp. 659-72.

[39]James G. Stroud and Everet F. Lindquist, "Sex Differences in Achievement in the Elementary and Secondary Schools," Journal of Educational Psychology, XXXIII (1942), pp. 657-67.

Pauley reported a study covering a fifteen year period in the Tulsa, Oklahoma, schools. He indicated a significant difference in the reading performance of boys and girls, and cited a need for different legal entering ages for school.[40]

Heilman cited a number of studies reporting sex differences in reading and concluded with the following two points:

1. Boys as a group are surpassed by girls as a group in reading achievement in grades one, two, and three.

2. The superiority in the reading ability of girls tends to diminish during the intermediate grades.[41]

The foregoing review of the literature tended to support the viewpoint that there are sex differences in reading achievement at the primary grades. However, the sex differences tend to disappear in the upper grades.

F. Perceptual and Physical Aspects of the Disadvantaged

A search of the literature failed to disclose any studies of the perceptual and physical development of the disadvantaged child.

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[40]Frank R. Pauley, "Sex Differences and Legal School Entrance Age," Journal of Educational Research, XXXV (1951), pp. 1-9.

[41]Arthur W. Heilman, Principles and Practices of Teaching Reading (Columbus, Ohio: Charles E. Merril Books, Inc., 1961), pp. 348-365.

Summary

Chapter II has presented the review of the literature in the areas of child development, perceptual development and testing, the correlation of physical abilities to achievement, characteristics of the socioeconomic disadvantaged child, sex differences in reading, and studies involving the perceptual physical aspects of the disadvantaged child.

Research into child development indicated that maturity is the important factor in the performance of boys and girls on tasks involving gross-motor, fine-motor, and perceptual skills. There tended to be general agreement that strength was a good indicator of maturity.

While there has been considerable research conducted in identifying the disadvantaged child and assessing his ability and potential for learning, the review of the literature failed to uncover any studies relating directly to his perceptual and physical development.

The basic research design and procedures to be utilized in this study will be found in Chapter III "Design of the Study." In addition, the instruments to be used will be presented along with a rationale for their use.

CHAPTER III

DESIGN OF THE STUDY

Selection of Subjects

During the first semester of the 1967-68 school year a selected sample of ninety-four kindergarten pupils from disadvantaged homes, and a selected sample of ninety-four pupils from non-disadvantaged homes, was taken from the Wichita, Kansas, kindergarten population of approximately 6000 pupils.

Wichita, Kansas, has approximately twenty-four community schools identified as target area schools for the purpose of qualifying for Federal assistance. These are target area schools because they have a high percentage of families in the very low income group. Not all of the children attending these schools meet the definition of the disadvantaged adopted for this study.

A survey was made in selected target area schools of the kindergarten enrollment cards located in the school offices. From the enrollment cards it was possible to identify children whose birthdates occured in the months of March, April, May, and June of 1962, and whose family

employment and dwelling areas appeared to meet (1) definition of the disadvantaged, (2) definition of the nondisadvantaged, and (3) who had not been in the headstart program.

From the initial screening, 224 children were identified, 118 of whom were tentatively classified as disadvantaged, and 106 of whom were tentatively classified as nondisadvantaged. The family background of each child was analyzed with the socioeconomic rating scale developed by Warner, Meeker and Eels, and modified for use with a questionnaire by Eels, to determine which children met the predetermined definition for the disadvantaged and the nondisadvantaged.[1] From the original sample, forty-seven boys and forty-seven girls were selected for the disadvantaged group, and forty-seven boys and forty-seven girls were selected for the nondisadvantaged.

Table I sets forth the distribution of the families of the children in the samples by occupation, and Table II sets forth the distribution by education.

There is some overlapping of the educational classifications and occupational classifications for the families of the samples. For example, two of the parents included in the disadvantaged sample indicated one year of college, while one parent in the nondisadvantaged sample indicated only an eighth grade education. A similar observation can be made

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[1] Kenneth Eels et al., Intelligence and Cultural Differences (Chicago: The University of Chicago Press, 1951), p. 91.

TABLE I

DISTRIBUTION OF THE SAMPLES BY OCCUPATION

Rating	Occupation	Nondisadvan.	Disadvan.
1	Professional, managerial (very large businesses)	9	0
2	Semiprofessional, managerial (large businesses, high-status white-collar workers)	14	0
3	Managerial (medium-size businesses) medium-status white-collar workers	22	0
4	Managerial (small businesses, low-status white-collar workers, skilled workers)	29	1
5	Managerial (very small businesses) apprentices	16	29
6	Semiskilled workers	4	42
7	Unskilled workers	0	22
Total		94	94

TABLE II

DISTRIBUTION OF THE SAMPLES BY EDUCATION

Rating	Schooling Completed	Nondisadvan.	Disadvan.
1	Professional school or graduate work	17	0
2	College (1-4 years)	53	2
3	High-school graduate	18	30
4	High-school non-graduate (1 - 3 years)	5	51
5	Grammar-school graduate (8th grade)	1	10
6	Grammar-school nongraduate (4 - 7 years)	0	1
7	Grammar-school nongraduate (0 - 3 years)	0	0
Total		94	94

in the distribution by occupation. Four parents of the non-disadvantaged sample were classified as semiskilled workers, and one parent of the disadvantaged sample was classified in category four which included skilled workers and low-status white-collar workers.

The basic explanation for this overlapping is that the other two factors of dwelling area and house type determined the final classification. Some families, in spite of their educational limitations, had managed to locate their families in a desirable dwelling area. Others had not taken advantage of their educational background, or, for other reasons, prefer to live in a less desirable dwelling or less pretentious home.

Table III presents the distribution by dwelling area, and Table IV presents the distribution by house type.

The Measurements

There were two evaluative instruments used in this study. The Frostig Developmental Test of Visual Perception was used to evaluate visual-motor skills. This test was standardized on approximately 2100 unselected nursery and public school children between the ages of three and nine years of age. Of the total sample of public school children only about 1.5 per cent came from high socioeconomic homes, ninety-three per cent from middle-class homes, and about 5.2 per cent from low socioeconomic homes.[2]

[2]The Marianne Frostig Developmental Test of Visual Perception: 1963 Standardization (Palo Alto, California: Consulting Psychologist Press, 1964), pp. 463-468.

TABLE III

DISTRIBUTION OF THE SAMPLES BY DWELLING AREA

Rating	Dwelling Area	Nondisadvan.	Disadvan.
1	Very high	5	0
2	High; the better suburbs	19	0
3	Above average; areas all residential, larger than average space around the houses, houses well-constructed and in good condition	42	0
4	Average; residential neighborhoods, no deterioration in the area	25	0
5	Below average; are not quite holding their own, beginning to deteriorate	3	18
6	Low, considerably deteriorated, rundown and semi-slum	0	73
7	Very low; slum	0	3
Total		94	94

TABLE IV

DISTRIBUTION OF THE SAMPLES BY HOUSE TYPE

Rating	House Type	Nondisadvan.	Disadvan.
1	Excellent houses	2	0
2	Very good houses	19	0
3	Good houses	36	0
4	Average houses	34	1
5	Fair houses	3	50
6	Poor houses	0	43
7	Very poor houses	0	0
Total		94	94

The test-retest reliability is .80 for the perceptual quotient when the tests are given by psychologists. When the tests are given by administrators who have been trained in giving the test, but who are not psychologists, the reliability has been computed to be .69 for the perceptual quotient.[3]

The Frostig Development Test of Visual Perception consists of six subtests:[4]

> Test I - Eye-motor Coordination - a test of eye-hand coordination involving the drawing of continuous straight, curved, or angled lines between boundaries of various width or from point to point.
>
> Test II - Figure-ground - a test involving shifts in perception of figures agains increasingly complex grounds. Intersecting and "hidden" geometric forms are used.
>
> Test III - Constancy of Shape - a test involving the recognition of certain geometric figures presented in a variety of sizes, shadings, textures, and positions in space, and their discrimination from similar geometric figures. Circles, squares, rectangles, ellipses and parallelograms are used.
>
> Test IV - Position in Space - a test involving the discrimination of reversals and rotations of figures presented in series. Schematic drawings representing common objects are used.
>
> Test V - Spatial Relationships - a test involving the analysis of simple forms and patterns. These consist of lines of various lengths and angles which the child is required to copy, using dots as guide points.

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[3] The Marianne Frostig Developmental Test of Visual Perception: Administration and Scoring Manual (Palo Alto, California: Consulting Psychologist Press, 1966), p. 5.

[4] Ibid.

Validity has been established through correlation with teacher ratings for classroom adjustment at .441 and with the Goodenough Test .460 at the kindergarten level.[5]

The Frostig Test yields a Perceptual Quotient, Perceptual Age, and a Scale Score.

> The Perceptual Quotient is a deviation score obtained from the sum of the subtest scale scores after correction for age variation. Unlike the scale scores, however, it is not a ratio; it has been defined in terms of constant percentiles for each age group, with a median of 100, upper and lower quartiles of 110 and 90, respectively, and other percentile ranks consistent with IQ values of the WISC for children.[6]

However, the raw score for each of the subtests was used in the analysis of the data for this study to achieve greater accuracy.

The Kraus-Weber Test of Muscular Strength and Flexibility was chosen to be administered to the selected samples of kindergarten children in this study for the following reasons:

1. There are no established norms for children under the age of ten in the popular AAHPER (American Association for Health, Physical Education, and recreation) test of physical achievement.[7]

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[5]Frostig, 1963 Standardization, loc. cit.

[6]Frostig, Administration and Scoring Manual, op. cit., p. 30.

[7]Edwin A. Fleishman, The Structure and Measurement of Physical Fitness (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), pp. 111-117.

2. Although the Kraus-Weber Test has no established norms, the test can be administered on a pass or fail basis.
3. The Kraus-Weber Test is easier to administer to kindergarten children than the AAHPER.
4. The Kraus-Weber Test is not designed to determine optimum levels of muscular fitness, but to determine whether the individual has sufficient strength and flexibility in the parts of the body upon which demands are made in normal daily living.[8]

While there are no norms for the Kraus-Weber Test, Kraus tested over 2000 American children and found that 57.9 per cent had failed.[9]

Kelliher conducted an extensive testing program on East Pakistan school children and computed the test reliability to be .851.[10]

The Kraus-Weber Test of Muscular Strength and Flexibility consists of a battery of six tests designed to test the following areas:

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[8]Hans Kraus, Ruth P. Hirschland, "Minimum Muscular Fitness Tests in School Children," Research Quarterly, XXV (1954), pp. 178-188.

[9]Marjorie Phillips et al., "Analysis of the Results from the Kraus-Weber Test of Minimum Muscular Fitness for Children," Research Quarterly, 26 (1955), pp. 315-23.

[10]M. S. Kelliher, "A Report on the Kraus-Weber Test in East Pakistan," Research Quarterly, 31 (March 1960), pp. 34-41.

1. Abdominal and psoas strength
2. Further test for abdominal strength
3. Psoas and lower abdominal strength
4. Upper back muscles
5. Lower back muscles
6. Length of back and hamstring muscles.[11]

In this study, the test was administered on a pass or fail basis for each subtest item. The number passing each item is reported and compared under the terms of each hypothesis. A frequency table has been prepared to indicate how many passed--all, five, four, three, two, one, and none--of the test items to serve as treatment for the composite score.

The Index of Status Characteristics. This social-status index is commonly referred to as the "I.S.C." and was employed as a socioeconomic rating scale to identify the disadvantaged child and the nondisadvantaged child as defined in this study.

The I.S.C. was developed by Warner, Meeker, and Eels in a study of a midwestern community in which he found a correlation of .97 between the I.S.C. and the social class placement of 209 families in his Jonesville study.[12]

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[11] "Guide for Health and Physical Education, Grade Three" (Wichita Public Schools, Wichita, Kansas), p. 56. (Mimeographed).

[12] W. Lloyd Warner, Marchia Meeker, and Kenneth Eels, Social Class in America (Chicago: Science Research Associates, Inc., 1949), p. 124.

Warner employed a system of seven-point rating scales of four different status characteristics. He used occupation, source of income, dwelling area, and house type, and combined the ratings of each into a single index by weighting occupation most heavily and dwelling area least heavily.[13] Warner obtained the information for his index with the interview technique.

Eels modified the Warner I.S.C. by substituting education of the parents for source of income, and used the questionnaire technique for obtaining his information. Equal weight was given to the four status characteristics and a .93 correlation was computed between the Eels modified I.S.C. and the Warner I.S.C. on a selected sample of one hundred children.[14]

The Eels modified I.S.C. was employed in this study to determine the socioeconomic status of the families of the children involved in this study.

A questionnaire, with a specific question to determine actual job classification, was devised to obtain the information of place and type of employment of father and mother. The questionnaire also inquired about the educational background of both parents with specific educational

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[13] Ibid., p. 181.

[14] Kenneth Eels et al., Intelligence and Cultural Differences (Chicago: The University of Chicago Press, 1951), p. 91.

levels to be checked. Where discrepancies existed between the employment and educational ratings of the father and mother, the midpoint of the scales was used by rounding off to a whole number where necessary in the direction of the father.[15] See Appendix A for sample of the questionnaire.

The rating for dwelling area and house type had to be obtained by visual inspection. The report of the Wichita Community Planning Council was consulted in obtaining ratings for dwelling areas. In this report, areas of deteriorated housing units were identified and tabulated by census tracts for 1960.[16]

Each of the four characteristics--occupation, education, dwelling area, and house type--were evaluated with the seven-point numerical rating scale developed by Warner and modified by Eels.[17] The scale for rating each of the four characteristics are illustrated in Tables V, VI, VII, and VIII.

The children whose socioeconomic rating index was twenty or more were defined as the disadvantaged. When discrepancies existed between the rating of the mother and the

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[15] Ibid., p. 94.

[16] "A Profile of Wichita," prepared by the Wichita Community Planning Council (Publication Number 72, December, 1965), pp. 87-93.

[17] Eels, op. cit., pp. 93-96.

TABLE V

SEVEN-POINT RATING SCALE FOR OCCUPATION

Rating	Occupation
1.	Professional, managerial (very large businesses)
2.	Semiprofessional, managerial (large businesses, high-status white-collar workers)
3.	Managerial (medium-size businesses), medium-status white-collar workers
4.	Managerial (small businesses, low-status white-collar workers, skilled workers)
5.	Managerial (very small businesses), apprentices
6.	Semiskilled workers
7.	Unskilled workers

TABLE VI

SEVEN-POINT RATING SCALE FOR DWELLING AREA

Rating	Dwelling Area
1.	Very high
2.	High; the better suburbs
3.	Above average; areas all residential, larger than average space around the houses, houses well-constructed and in good condition
4.	Average; residential neighborhoods, no deterioration in the area
5.	Below average; are not quite holding their own, beginning to deteriorate
6.	Low, considerably deteriorated, rundown and semislum
7.	Very low; slum

TABLE VII

SEVEN-POINT RATING SCALE FOR HOUSE TYPE

Rating	House Type
1.	Excellent houses
2.	Very good houses
3.	Good houses
4.	Average houses
5.	Fair houses
6.	Poor houses
7.	Very poor houses

TABLE VIII

SEVEN-POINT RATING SCALE FOR EDUCATION

Rating	School Completed
1.	Professional school or graduate work
2.	College (1 - 4 years)
3.	High-school graduate
4.	High-school nongraduate (1 - 3 years)
5.	Grammar-school graduate (8th grade)
6.	Grammar-school nongraduate (4 - 7 years)
7.	Grammar-school nongraduate (0 - 3 years)

rating of the father, the mid-point was taken and fractions rounded off to a whole number in the direction of the father.[18]

Collection of Data

Permission was obtained from the Wichita Public Schools to examine the kindergarten enrollment records of the following schools located in communities designated as target areas for poverty program purposes in Wichita, Kansas: Waco, Finn, Rogers, MacArthur, Ingalls, Park, Martinson, Mueller, and Arkansas Avenue. The non-target area schools of McLean, Harris, Lowell, Cloud, OK, Carter, Buckner, and Price were also visited and the kindergarten enrollment cards examined.

The information of age, date of birth, sex, occupation of the parents, and address was obtained. Those children who had been in headstart programs were not selected. The parents of one hundred and eighteen children who appeared to meet the criteria established to identify the disadvantaged were mailed a return envelope with a questionnaire concerning employment and educational background of the parents. One hundred and six children who appeared to meet the criteria for the nondisadvantaged were mailed the same questionnaire with a return envelope.

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[18] Eels, op. cit., p. 94.

Seventy of the parents tentatively classified as the disadvantaged returned the original questionnaire. Eighty-one of the parents from those tentatively classified as nondisadvantaged returned the original questionnaire. A second mailing of the questionnaire to those who had not returned the original produced eight more of the disadvantaged grouping and five of the nondisadvantaged grouping. Telephoning secured twenty-six more for the disadvantaged and twelve for the nondisadvantaged (See Table IX).

Dwelling areas and house types were rated with the seven-point rating scales for house type and dwelling area. The application of the rating scales required a visual inspection of the dwelling areas of each home.

From the information obtained and the application of the I.S.C. rating scale, forty-seven boys and forty-seven girls of the disadvantaged category were selected and forty-seven boys and forty-seven girls of the nondisadvantaged category were selected.

The Kraus-Weber Test of Muscular Strength and Flexibility and the Frostig Developmental Test of Visual Perception were administered. Students from the College of Education of Wichita State University assisted with the testing as observers and proctors.

TABLE IX

RETURN OF SOCIOECONOMIC QUESTIONNAIRE

Source	Disadvantaged		Nondisadvantaged	
	Girls	Boys	Girls	Boys
First Mailing	38	32	39	42
Second Mailing	2	6	7	1
Telephone	14	12	3	9
Total	54	50	49	52
Selected for study	47	47	47	47

Control of Variables

The variables of socioeconomic background were controlled by application of the socioeconomic rating scale. An equal number of boys and girls were selected to control the sex variable; only children with birthdates of March, April, May, and June of 1962 were selected to compensate the variable of age. All of the tests were administered by one person.

Analysis of Data

The raw data were punched on data-processing cards and analyzed by an IBM 1620 computer. The technique for analyzing the data gathered by the Frostig Developmental Test of Visual Perception was the *t* test of significance for differences of means of related samples. The data gathered met the basic assumptions of normality of the population distribution and continuity of the quantitative data.[19]

The Kraus-Weber Test of Muscular Strength and Flexibility was administered on a pass or fail basis. Under the terms of each hypothesis this produced two variables to be categorized in two ways. This was a fourfold classification pertinent to the underlying assumption of the chi-square

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[19]Allen L. Edwards, Experimental Design in Psychological Research (1st ed. rev; New York: Holt, Rinehart and Winston, 1964), pp. 111-113.

test of significance: that the observed frequencies in a category are a chance departure from the unexpected frequencies.[20]

The null hypothesis, no significant difference between the performance of the disadvantaged children and the performance of the nondisadvantaged on the evaluative instruments, was tested. A two-tailed test was employed, with the null hypothesis being rejected only when there was a significant difference at the .05 confidence level.[21]

Chapter III has provided a discussion of the design of the study, the collection of the data, and the instruments that were used. A brief discussion of the statistical treatment of the data has also been included.

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[20]Deobold B. Van Dalen, Understanding Educational Research (New York: McGraw-Hill Book Company, Inc., 1962), p. 330.

[21]Edwards, op. cit., pp. 94-95.

CHAPTER IV

TREATMENT OF DATA

The purpose of this study was to determine if a disadvantaged background had any relationship to perceptual development as measured by the Frostig Developmental Test of Visual Perception, and to the development of strength and flexibility as measured by the Kraus-Weber Test of Muscular Strength and Flexibility. A secondary purpose of the study was to determine whether sex was an influencing factor in performance on the two tests administered.

A selected sample of kindergarten children from disadvantaged socioeconomic backgrounds was compared to a selected sample of kindergarten children from nondisadvantaged socioeconomic backgrounds on the basis of the raw scores of the five subtests as well as the composite raw score of the Frostig Developmental Test of Visual Perception. The performance of the boys was compared with the performance of the girls on the five subtests and the composite. The comparison of the performance of boys and girls was made within the two socioeconomic groups and between the two socioeconomic groups.

The technique used for analyzing the data for the Frostig Developmental Test of Visual Perception was the t test of significance for difference of means of related samples. The data gathered met the basic assumptions of normality of the population distribution and continuity of the quantitative data.[1]

The Kraus-Weber Test of Muscular Strength and Flexibility was administered on a pass or fail basis. Under the terms of each hypothesis this produced two variables: sex and result; disadvantaged or nondisadvantaged and result; to be categorized in two ways. This was a fourfold classification pertinent to the underlying assumptions of the chi-square test of significance: that the observed frequencies in a category are a chance departure from the expected frequencies.[2]

The performance of the selected sample of kindergarten children from the disadvantaged socioeconomic backgrounds was compared to the performance of the selected sample of children from the nondisadvantaged socioeconomic backgrounds on the six subtests of the Kraus-Weber Test of Muscular Strength and Flexibility. The performance of boys was compared to the performance of girls within the two socioeconomic groups and between the two socioeconomic groups.

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[1]Edwards, loc. cit.

[2]Van Dalen, loc. cit.

The composite score for this test was presented in terms of how many passed all, five, four, three, two, one, and none of the subtest items. The composite scores are presented in a frequency distribution table (See Appendix H).

All raw data were punched on data processing cards. The data were then analyzed by an IBM 1620 computer. The null hypothesis, no significant difference between the performance of the nondisadvantaged children and the performance of the disadvantaged, and no significant difference between the performance of boys and girls on the evaluative instruments, was tested. A two-tailed test was employed, with the null hypothesis being rejected only when there was a significant difference at or above the .05 confidence level.[3]

The following groups were analyzed for performance on the Frostig Developmental Test of Visual Perception with the t test of significance:

1. Disadvantaged children and nondisadvantaged children.
2. Disadvantaged boys and disadvantaged girls.
3. Nondisadvantaged boys and nondisadvantaged girls.
4. Disadvantaged boys and nondisadvantaged boys.
5. Disadvantaged girls and nondisadvantaged girls.

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[3]Edwards, op. cit., pp. 94-95.

The following groups were analyzed for performance on the Kraus-Weber Test of Muscular Strength and Flexibility with the chi-square test of significance:

1. Disadvantaged children and nondisadvantaged children.
2. Disadvantaged boys and disadvantaged girls.
3. Nondisadvantaged boys and nondisadvantaged girls.
4. Disadvantaged boys and nondisadvantaged boys.
5. Disadvantaged girls and nondisadvantaged girls.

The findings from the use of these analysis were used to determine whether or not a relationship existed between (1) socioeconomic background and performance on the two evaluative instruments, and (2) sex and performance on the two evaluative instruments.

Hypothesis 1. There is no significant difference, operationally defined as the .05 confidence level, in the performance of children from disadvantaged socioeconomic backgrounds and the performance of children from nondisadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination
b. Figure-ground
c. Constancy of Shape
d. Position in Space
e. Spatial Relationships
f. The Composite Score

The mean score for children from nondisadvantaged socioeconomic backgrounds significantly exceeded the mean score for children from disadvantaged socioeconomic backgrounds on each of the subtests and the composite score.

A computed *t* value larger than plus or minus 1.98 was required to reject the null hypothesis at the .05 confidence level. To reject at the .01 confidence level, the computed *t* value had to be larger than plus or minus 2.61. The computed value for each of the subtests and the composite score permitted the rejection of the null hypothesis at the .01 confidence level (See Table X). There was a significant difference in the performance of the two groups on each of the subtests and the composite score in favor of the children from nondisadvantaged socioeconomic backgrounds.

Hypothesis 2. There is no significant difference, operationally defined as the .05 confidence level, in the performance of boys from disadvantaged socioeconomic backgrounds and the performance of girls from disadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination

b. Figure-ground

c. Constancy of Shape

d. Position in Space

e. Spatial Relationships

f. The Composite Score

TABLE X

THE FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION DISADVANTAGED CHILDREN VS. NONDISADVANTAGED CHILDREN

	Disadvantaged	Nondisadvantaged	
Test	Mean Raw Score	Mean Raw Score	$\underline{t}$ Value
a.	10.021	13.425	-6.210*
b.	9.531	13.840	-6.266*
c.	4.244	7.393	-7.177*
d.	3.329	5.553	-8.453*
e.	2.234	4.191	-7.829*
f.	29.361	44.404	-9.389*

*Significant at the .01 level

With the exception of subtest e, Spatial Relationships, the mean score for girls from disadvantaged socioeconomic backgrounds significantly exceeded the mean score for boys from disadvantaged socioeconomic backgrounds for each of the subtests and the composite score.

A computed *t* value larger than plus or minus 1.99 was required to reject the null hypothesis at the .05 confidence level. To reject at the .01 confidence level the computed *t* had to be larger than plus or minus 2.69. The computed *t* value for subtests a, b, c, and d permitted the rejection of the null hypothesis at the .05 confidence level. The computed *t* value for the composite score permitted rejection of the null hypothesis at the .01 confidence level. The null hypothesis was accepted for subtest e, Spatial Relationships (See Table XI).

Hypothesis 3. There is no significant difference, operationally defined as the .05 confidence level, in the performance of boys from nondisadvantaged socioeconomic backgrounds and the performance of girls from nondisadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination

b. Figure-ground

c. Constancy of Shape

d. Position in Space

e. Spatial Relationships

TABLE XI

THE FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION
DISADVANTAGED BOYS VS. DISADVANTAGED GIRLS

	Boys	Girls	
Test	Mean Raw Score	Mean Raw Score	$\underline{t}$ Value
a	9.148	10.893	-2.173**
b	8.297	10.765	-2.426**
c	3.659	4.829	-2.170**
d	2.893	3.765	-2.298**
e	1.957	2.510	-1.569**
f	25.957	32.765	-2.927*

*Significant at the .01 level
**Significant at the .05 level

f. The Composite Score

The mean score for girls from nondisadvantaged socioeconomic backgrounds significantly exceeded the mean score for boys from nondisadvantaged socioeconomic backgrounds on subtests a and e, and the composite score. The null hypothesis was rejected at the .01 confidence level for subtests a and e, and at the .05 confidence level for the composite score.

The computed t value had to be greater than plus or minus 1.99 for rejection at the .05 confidence level and greater than plus or minus 2.69 for rejection at the .01 confidence level. (See Table XII).

Although the mean score for girls on subtests b, c, and d exceeded the mean score for boys, the differences were not statistically significant at the .05 confidence level.

Hypothesis 4. There is no significant difference, operationally defined as the .05 confidence level, in the performance of boys from disadvantaged socioeconomic backgrounds and the boys from nondisadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination

b. Figure-ground

c. Constancy of Shape

d. Position in Space

TABLE XII

THE FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION
NONDISADVANTAGED BOYS VS. NONDISADVANTAGED GIRLS

	Boys	Girls	
Test	Mean Raw Score	Mean Raw Score	t Value
a	12.382	14.468	-2.995*
b	13.404	14.276	-0.979
c	6.957	7.829	-1.285
d	5.276	5.829	-1.579
e	3.680	4.702	-3.043*
f	41.702	47.106	-2.668**

*Significant at the .01 level
**Significant at the .05 level

e. Spatial Relationships

f. The Composite Score

The mean score for boys from nondisadvantaged socioeconomic backgrounds significantly exceeded the mean score for boys from disadvantaged socioeconomic backgrounds on each of the subtests and the composite score.

A computed t value larger than plus or minus 1.99 was required to reject the null hypothesis at the .05 confidence level. To reject at the .01 confidence level the computed t had to be larger than plus or minus 2.69. The computed t value for each of the subtests and the composite score permitted the rejection of the null hypothesis at the .01 confidence level. There was a significant difference in the performance of the two groups on each of the subtests and the composite score in favor of the boys from nondisadvantaged socioeconomic backgrounds (See Table XIII).

Hypothesis 5. There is no significant difference, operationally defined as the .05 confidence level, in the performance of girls from disadvantaged socioeconomic backgrounds and the performance of girls from nondisadvantaged socioeconomic backgrounds on the following subtests of the Frostig Developmental Test of Visual Perception:

a. Eye-motor Coordination

b. Figure-ground

c. Constancy of Shape

d. Position in Space

TABLE XIII

THE FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION
DISADVANTAGED BOYS VS. NONDISADVANTAGED BOYS

	Disadvantaged	Nondisadvantaged	
Test	Mean Raw Score	Mean Raw Score	$\underline{t}$ Value
a	9.148	12.382	-4.491*
b	8.297	13.404	-5.142*
c	3.659	6.957	-5.833*
d	2.893	5.276	-6.543*
e	1.957	3.680	-5.054*
f	25.957	41.702	-7.621*

*Significant at the .01 level

e. Spatial Relationships

f. The Composite Score

The mean score for girls from nondisadvantaged socioeconomic backgrounds significantly exceeded the mean score for girls from disadvantaged socioeconomic backgrounds on each of the subtests and the composite score.

A computed t value larger than plus or minus 1.99 was required to reject the null hypothesis at the .05 confidence level. To reject the null hypothesis at the .01 confidence level the computed t value had to be larger than plus or minus 2.69. The computed t value for each of the subtests and the composite score permitted the rejection of the null hypothesis at the .01 confidence level. There was a significant difference in the performance of the two groups in favor of the girls from nondisadvantaged socioeconomic backgrounds (See Table XIV).

Hypothesis 6. There is no significant difference, operationally defined as the .05 confidence level, in the performance of children from disadvantaged socioeconomic backgrounds and the performance of children from nondisadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

TABLE XIV

THE FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION
DISADVANTAGED GIRLS VS. NONDISADVANTAGED GIRLS

	Disadvantaged	Nondisadvantaged	
Test	Mean Raw Score	Mean Raw Score	$\underline{t}$ Value
a	10.893	14.468	-4.574*
b	10.765	14.276	-3.827*
c	4.829	7.829	-4.566*
d	3.765	5.829	-5.635*
e	2.510	4.702	-6.310*
f	32.765	47.106	-6.263*

*Significant at the .01 level

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

The Maier formula for computation of chi-square was used to determine if the observed frequencies in a category were a chance departure from the hypothetical or expected frequencies for the category.[4] The computed chi-square value had to be larger than 3.84 to reject the null hypothesis. The null hypothesis was accepted for each of the subtests; there were no significant differences in the performance of the two groups (See Table XV).

Hypothesis 7. There is no significant difference, operationally defined as the .05 confidence level, in the performance of boys from disadvantaged socioeconomic backgrounds and the performance of girls from disadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Posas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

The computed chi-square value had to be larger than 3.84 to reject the null hypothesis. The null hypothesis

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[4]Edwards, op. cit., p. 69.

TABLE XV

THE KRAUS-WEBER TEST OF MUSCULAR STRENGTH AND FLEXIBILITY DISADVANTAGED CHILDREN VS. NONDISADVANTAGED CHILDREN

Test	Chi-square Value*
a	0.482
b	0.191
c	1.549
d	0.077
e	1.263
f	.116

*None of the obtained chi-square values were significant at the .05 level

was accepted for each of the subtests; there were no significant differences in the performance of disadvantaged boys and girls (See Table XVI).

Hypothesis 8. There is no significant difference, operationally defined as the .05 confidence level, in the performance of girls from nondisadvantaged socioeconomic backgrounds and the performance of boys from nondisadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

The computed chi-square value had to be larger than 3.84 to reject the null hypothesis. The null hypothesis was accepted for each of the subtests; there were no significant differences in the performance of nondisadvantaged boys and girls (See Table XVII).

Hypothesis 9. There is no significant difference, operationally defined as the .05 confidence level, in the performance of boys from disadvantaged socioeconomic backgrounds and the performance of boys from nondisadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

TABLE XVI

THE KRAUS-WEBER TEST OF MUSCULAR STRENGTH AND FLEXIBILITY DISADVANTAGED BOYS VS. DISADVANTAGED GIRLS

Test	Chi-square Value*
a	0.055
b	0.685
c	0.000
d	1.229
e	0.000
f	1.398

*None of the obtained chi-square values were significant at the .05 level.

TABLE XVII

THE KRAUS-WEBER TEST OF MUSCULAR STRENGTH AND FLEXIBILITY NONDISADVANTAGED BOYS VS. NONDISADVANTAGED GIRLS

Test	Chi-square Value*
a	1.055
b	0.170
c	0.000
d	1.602
e	0.083
f	0.981

*None of the obtained chi-square values were significant at the .05 level.

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

The computed chi-square value had to be larger than 3.84 to reject the null hypothesis. The null hypothesis was accepted for each of the subtests; there were no significant differences in the performance of disadvantaged boys and nondisadvantaged boys (See Table XVIII).

Hypothesis 10. There is no significant difference, operationally defined as the .05 confidence level, in the performance of girls from disadvantaged socioeconomic backgrounds and the performance of girls from nondisadvantaged socioeconomic backgrounds on the following subtests of the Kraus-Weber Test of Muscular Strength and Flexibility:

a. Abdominal and Psoas Strength

b. Further Test for Abdominal Strength

c. Psoas and Lower Abdominal Strength

d. Upper Back Muscles

e. Lower Back Muscles

f. Length of Back and Hamstring Muscles

The computed chi-square value had to be larger than 3.841 to reject the null hypothesis. The null hypothesis was accepted for each of the subtests; there were no

TABLE XVIII

THE KRAUS-WEBER TEST OF MUSCULAR STRENGTH AND FLEXIBILITY DISADVANTAGED BOYS VS. NONDISADVANTAGED BOYS

Test	Chi-square Value*
a	0.981
b	0.000
c	0.261
d	1.229
e	0.263
f	0.050

*None of the obtained chi-square values were significant at the .05 level.

significant differences in the performance of disadvantaged girls and nondisadvantaged girls (See Table XIX).

TABLE XIX

THE KRAUS-WEBER TEST OF MUSCULAR STRENGTH AND FLEXIBILITY DISADVANTAGED GIRLS VS. NONDISADVANTAGED GIRLS

Test	Chi-square Value*
a	0.059
b	0.171
c	0.510
d	1.602
e	0.677
f	0.000

*None of the obtained chi-square values were significant at the .05 level.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine whether socioeconomic background had any relationship to perceptual development as measured by the Frostig Developmental Test of Visual Perception, and to the development of strength and flexibility as measured by the Kraus-Weber Test of Muscular Strength and Flexibility. A secondary purpose of the study was to determine if sex was an influencing factor in performance on the two tests administered.

The data for the study were gathered from a selected sample of ninety-four kindergarten children from disadvantaged socioeconomic backgrounds and a selected sample of ninety-four kindergarten children from nondisadvantaged socioeconomic backgrounds by (1) examination of school enrollment cards, (2) administration of the Warner-Eels I.S.C. socioeconomic rating scale as modified for use with questionnaire, (3) administration of the Frostig Developmental Test of Visual Perception, and (4) administration of the Kraus-Weber Test of Muscular Strength and Flexibility.

The sample included ninety-four children (forty-seven boys and forty-seven girls) from disadvantaged socio-economic backgrounds and ninety-four children (forty-seven boys and forty-seven girls) from nondisadvantaged socio-economic backgrounds.

Comparisons were made on the five subtests and the composite score of the Frostig Developmental Test of Visual Perception using the t test of significance for difference of means of related samples.

The Kraus-Weber Test of Muscular Strength and Flexibility was administered on a pass or fail basis and the chi-square test of significance was used to analyze the data. The level of significance selected for this study was the .05 level of confidence.

Findings

An analysis of the data for the Frostig Developmental Test of Visual Perception revealed the following:

1. When the children were grouped on the basis of disadvantaged and nondisadvantaged, the children from the nondisadvantaged backgrounds scored significantly higher on all the subtests than the children from the disadvantaged backgrounds.

2. When girls were compared to boys, the girls, with the exception of tests two, three, and four, involving nondisadvantaged boys and nondisadvantaged girls, and test number five involving disadvantaged boys and disadvantaged

girls, scored significantly higher. In all the subtests, the mean scores for the girls were higher than the mean scores for the boys.

3. When nondisadvantaged girls were compared to disadvantaged girls, and nondisadvantaged boys were compared to disadvantaged boys, the children from the nondisadvantaged backgrounds scored significantly higher on all the subtests than children from disadvantaged backgrounds.

An analysis of the data for the Kraus-Weber Test of Muscular Strength and Flexibility revealed the following:

1. When the children were grouped as disadvantaged or nondisadvantaged there were no significant differences in their performance on any one of the six subtests.

2. When boys were compared to girls there were no significant differences in their performance on any one of the subtests.

Conclusions

Data collected on the pupil population included in this study support the following conclusions:

1. There is a significant relationship between socioeconomic background and perceptual development as measured by the Frostig Developmental Test of Visual Perception.

2. There is a significant relationship between sex and perceptual development as measured by the Frostig Developmental Test of Visual Perception.

3. There is no significant relationship between sex and the development of strength and flexibility as measured by the Kraus-Weber Test of Strength and Flexibility.

4. There is no significant relationship between socioeconomic background and the development of strength and flexibility as measured by the Kraus-Weber Test of Strength and Flexibility.

Recommendations

1. Additional study should be given to the relationship between socioeconomic background and perceptual development using other measuring instruments.

2. Instruments for measuring perceptual development should be chosen that do not require the use of eye-motor skills and are not so dependent upon the ability to understand and follow directions.

3. A longitudinal study should be undertaken to correlate school achievement to the data obtained in this study to determine predictive value.

4. Consideration should be given to the structuring of kindergarten experiences that would strengthen the performance areas measured by the Frostig Developmental Test of Visual Perception.

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APPENDIX A

QUESTIONNAIRE TO PARENTS

WICHITA STATE UNIVERSITY
Wichita, Kansas 67208
Phone MUrray 3-7561

December 15, 1967

Dear Parents:

During the month of November I was given permission by the Wichita Public Schools to test a group of kindergarten children whose birthdays occur in the months of March, April, May, and June. These children will be tested for perceptual development (to find out how well they can see likenesses, differences, figure-background, and spatial relationship) and for muscular strength and flexibility.

The purpose of this study is to determine if there is a difference in the performance of girls when compared to boys, and to determine how different family backgrounds affect the maturity level of perceptual and muscular development.

_____ was chosen to be tested because _____ birthdate occurs in the month of _____.

The information gained from this study may be useful in helping children learn to read. More information is needed, however, to complete the study. Would you please be kind enough to assist us in this study by completing the attached questionnaire and mailing it to me in the return envelope. The few minutes you take to do this may contribute toward some child being better taught to read.

Thank you for your help.

Sincerely,

Coker J. Denton
Director, Reading Center
Wichita State University

WICHITA STATE UNIVERSITY

Code No._____

1. Place of father's employment_____
Business or Firm Name

2. Father's job assignment with the business or firm_____

_____
(If there is a title like watchman, foreman, clerk, manager, president, owner, etc., list it)

3. Father's educational background: Indicate the highest grade completed: 1___, 2___, 3___, 4___, 5___, 6___, 7___, 8___, 9___, 10___, 11___, 12___. College 1 yr.___, 2 yr.___, 3 yr.___, College Graduate, ___, Postgraduate,___, Professional___.

4. Mother's place of employment_____
Business Name

5. Mother's job assignment with the business or firm_____
(If there is a job title, list it)

6. Mother's educational background: Indicate the highest grade completed: 1___, 2___, 3___, 4___, 5___, 6___, 7___, 8___, 9___, 10___, 11___, 12___. College 1 yr.___, 2 yr.___, 3 yr.___, College Graduate, ___, Postgraduate,___, Professional___.

APPENDIX B

RESEARCH PROPOSAL FOR THE WICHITA PUBLIC SCHOOLS

RESEARCH PROPOSAL

Name Coker J. Denton Date 10/2/67

Home Address 319 N. Dellrose School WSU

1. Title and brief description of the proposed study. This is a study to compare visual-motor skills and body strength of a selected distribution of disadvantaged kindergarten children and a selected distribution of non-disadvantaged kindergarten children.

2. Statement of the educational problem as seen by the researcher. Research indicates that disadvantaged children do not perform as well on tests of verbal ability and intelligence as non-disadvantaged children, nor do they achieve as successfully in school. Research does not indicate whether the disadvantaged child performs as well on tests of visual-motor skills and tests of body strength and flexibility as the nondisadvantaged child. For purposes of this study, the disadvantaged child will be defined in socio-economic terms and identified by a socio-economic rating scale.

3. Specific purposes and expected outcomes. Hypotheses to be tested may be stated. The specific objective of the study is to compare the performance of a selected group of disadvantaged kindergarten children with the performance of a selected group of non-disadvantaged kindergarten children using the Frostig Developmental Test of Visual Perception and the Kraus-Weber Test of Muscular Strength and Flexibility as the evaluative instruments. The null hypothesis, that there will be no significant difference, will be tested.

4. Personnel (administrators, teachers, pupils, and others), schools and classes to be involved. It is proposed that approximately 100 selected kindergarten children from the target area schools of Waco, Finn, Rogers, Ingalls, Park, Martinson, and Mueller be tested, and 100 selected kindergarten children from McLean, Harris, Lowell, Cloud, Carter, and Buckner be tested. Personnel from Wichita State University, College of Education will administer

RESEARCH OFFICE USE

DATE RESEARCH COMPLETED

DATE REPORT SUBMITTED

the tests. Building administrators will need only to be aware of the objectives of the testing program and make enrollment records available to the researcher and provide time and space for testing. Kindergarten teachers can continue their regular program, making small groups available for testing during the day.

5. Expected starting date, duration of the study, and expected date of final report. It is anticipated that identification of the children to be tested can be completed during October 1967 and that testing can begin during the week of November 1, 1967 and be completed by December 1, 1967. The analysis of the data should be completed by May 1, 1968.

6. Materials and supplies needed. How financed? personal, school, or division. The necessary testing materials will be supplied by the researcher.

7. Procedures and methods to be employed. The researcher will survey the kindergarten enrollment cards in the school offices and identify kindergarten children whose birthdays occur in the months of March, April, May, or June, 1962, and who have not been in the headstart program. The family background of these children will be analyzed using the socioeconomic rating scale developed by Warner, Eels, Havighurst, and Tyler to determine which children meet a pre-determined definition for the disadvantaged. From those meeting the definition of the disadvantaged approximately fifty boys and fifty girls will be selected. The non-disadvantaged will be defined as those not meeting the criteria for the defintion of the disadvantaged. An effort will be made to select fifty boys and fifty girls for a stratified distribution.

   The names of the children will be coded with a numeral so that the anonymity of the children will be protected in the publication of the data. The coded list will be given to the Research Department of the Wichita Public Schools for possible further study. There will be no need to make contact with the family of the children involved.

   Only two visits to each school should be necessary, one to identify the children and one to test them. Appointments and schedules shall be worked out with the building administrators to identify and test the children. The testing will be conducted on an individual basis, and the testing time per pupil should take no longer than forty minutes.

8. Methods of evaluation, including data analysis. Appropriate tests of significance will be employed to determine if significant differences exist.

9. Suggested follow-up activities. The study may be valuable from the following points: (1) Significant differences in performance between the two cultural groups may be important in structuring school and preschool experiences. (2) The inverse of this may also be true. (3) A longitudinal study correlating performance on the testing instruments and future school success might be undertaken. (4) An analysis of boy versus girl performance may have implications.

Approval	Date
Principal _____	_____
Director of Research _____	_____
Director of Pupil Services _____	_____
Assistant Superintendent _____	_____
Deputy Superintendent _____	_____

APPENDIX C

APPROVAL LETTER FROM RESEARCH COUNCIL

WICHITA PUBLIC SCHOOLS
Wichita, Kansas 67202

Division of Research and Information

Mr. Coker J. Denton, Wichita State University, has received Research Council approval to conduct a research study using data obtained from public school children in Wichita. The study will compare visual-motor skills and body strength of a selected distribution of disadvantaged kindergarten children and a selected distribution of non-disadvantaged kindergarten children. A total of 200 children will be selected from fourteen elementary schools involved in the study.

Mr. Denton will need to examine school records in order to identify kindergarten children eligible for the study. After the identification is made, arrangements will be made for Wichita State University personnel to administer the Frostig Developmental Test of Visual Perception and the Kraus-Weber Test of Muscular Strength and Flexibility.

This will authorize you to make school records for kindergarten children available for Mr. Denton's examination and to allow the testing to be done. Plans are to complete the testing during November 1967. Anonymity of individual children and schools will be maintained in reporting the results.

Mr. Denton will communicate with you concerning the study. Your cooperation in this research will be appreciated. If I can assist by providing additional information, please let me know.

Sincerely,

Ralph E. Walker, Director
Division of Research and
Information

REW:ps

APPENDIX D

DATA GATHERING FORM FOR ANALYZING SCHOOL RECORDS

School_____Teacher_____

Name:_____Sex_____Birthdate_____

Address:_____Phone_____

I. Father's Name_____ Index

Father's Occupation_____ _____

II. Mother's Name_____

Mother's Occupation_____ _____

III. Dwelling Area_____ _____

IV. House Type_____ _____

_____

APPENDIX E

COMPILATION FORM FOR SOCIOECONOMIC DATA

Code_____

I. Education _____
   A. Mother ____
   B. Father ____

II. Employment _____
   A. Mother ____
   B. Father ____

III. Dwelling Area _____

IV. House Type _____

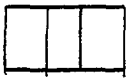
V. Sum of Indexes _____

VI. Socioeconomic Code _____

Note: Where education and employment of the parents differ--the midpoint will be used with rounding off to the nearest whole number in the direction of the father.

APPENDIX F

TEST DATA COMPILATION FORM



Name Code



Sex
1. Male
2. Female



Age
1. March
2. April
3. May
4. June



Socio-economic status
1. Disadvantaged
2. Nondisadvantaged

Frostig Test (Raw Scores)



Test I (1-30)



Test II (0-20)



Test III (0-17)



Test IV (0-8)



Test V (0-8)



Composite (0-83)

Kraus-Weber Test (0 = Failed, 1 = Passed)

☐ Test 1

☐ Test 2

☐ Test 3

☐ Test 4

☐ Test 5

☐ Test 6

☐ Composite (Number of items failed)

APPENDIX G

RAW DATA

CODING FOR RAW DATA

Sex:
1. Male
2. Female

Birthdate:
1. March
2. April
3. May
4. June

Socioeconomic Status:
1. Disadvantaged
2. Nondisadvantaged

Frostig Test: (Raw Scores)

Kraus-Weber:
0 = Failed
1 = Passed

RAW DATA

FROSTIG DEVELOPMENTAL TEST OF VISUAL PERCEPTION AND KRAUS-WEBER TEST OF MUSCULAR STRENGTH AND FLEXIBILITY, NONDISADVANTAGED CHILDREN GROUPED BY SEX

Pupil Number	Sex	Birth-Date	Soc. Eco.	Frostig						Kraus-Weber						No.of Tests Failed
				1	2	3	4	5	Sum	1	2	3	4	5	6	
17	1	2	2	14	18	11	8	5	56	1	1	1	0	1	1	1
18	1	2	2	11	19	13	6	5	54	1	0	1	1	1	1	1
20	1	2	2	7	10	8	4	2	31	1	1	1	0	0	1	2
21	1	4	2	13	16	7	4	3	43	0	0	1	1	0	0	4
25	1	3	2	11	8	9	6	2	36	0	0	1	1	0	0	4
26	1	4	2	8	15	6	7	2	38	1	0	1	1	1	1	1
28	1	3	2	10	18	9	5	4	46	1	1	1	0	0	1	2
104	1	2	2	17	13	11	7	6	54	1	1	1	1	1	1	0
105	1	4	2	6	18	5	5	3	37	0	0	1	1	1	1	2
107	1	4	2	8	4	9	7	2	30	1	1	1	1	1	1	0
108	1	2	2	15	5	6	6	5	37	1	1	1	1	1	1	0
115	1	2	2	15	17	9	6	6	53	1	1	1	1	1	1	0
116	1	2	2	16	11	12	7	6	52	1	0	1	1	0	1	2
117	1	4	2	8	17	6	8	4	43	1	1	1	1	1	1	0
124	1	4	2	10	9	7	1	1	28	1	1	1	1	1	1	0
125	1	2	2	16	2	5	5	3	31	0	0	1	1	1	1	2
128	1	3	2	18	17	7	5	3	50	0	0	1	1	1	0	3
133	1	3	2	8	2	2	6	2	20	1	0	1	1	1	1	1

Pupil Number	Sex	Birth-Date	Soc. Eco.	Frostig						Kraus-Weber						No. of Tests Failed
				1	2	3	4	5	Sum	1	2	3	4	5	6	
135	1	1	2	8	5	0	3	1	17	1	1	1	1	1	1	0
144	1	3	2	13	14	8	6	6	47	0	0	1	1	1	1	2
145	1	3	2	14	10	10	1	4	39	1	0	1	0	1	0	3
146	1	3	2	13	16	9	5	6	49	1	0	1	1	1	1	1
147	1	1	2	16	18	6	6	4	50	1	1	1	1	1	1	0
148	1	1	2	16	20	13	8	6	63	1	1	1	1	1	1	0
149	1	3	2	19	17	5	6	2	49	1	1	1	1	1	1	0
152	1	2	2	5	8	5	4	3	25	0	0	0	1	0	0	5
155	1	3	2	12	17	8	5	3	45	1	1	1	1	1	1	0
160	1	2	2	15	20	6	7	5	53	1	1	1	1	1	1	0
161	1	2	2	14	11	3	5	4	37	1	1	1	1	1	1	0
162	1	1	2	12	19	9	6	5	51	1	0	1	1	1	1	1
163	1	2	2	12	14	2	7	5	40	1	1	1	1	1	1	0
166	1	3	2	12	9	5	3	0	29	1	0	1	1	1	0	2
169	1	1	2	15	17	6	8	5	51	1	0	1	1	1	1	1
173	1	1	2	10	11	6	3	1	31	1	0	1	1	1	0	2
189	1	4	2	12	9	2	5	1	29	1	1	1	1	1	0	1
190	1	4	2	7	13	8	6	3	37	1	1	1	1	0	0	2
191	1	1	2	10	13	5	5	4	37	1	0	1	1	1	1	1
193	1	3	2	15	16	11	5	6	53	0	0	1	1	1	0	3
198	1	4	2	18	15	5	6	2	46	1	1	1	1	1	1	0
199	1	1	2	11	16	6	4	4	41	1	1	1	1	1	1	0
200	1	3	2	11	20	5	4	3	43	1	0	1	0	1	0	3
201	1	3	2	15	15	8	3	4	45	1	1	1	1	1	1	0
202	1	3	2	9	13	7	3	1	33	1	1	1	1	1	0	1
203	1	1	2	14	11	7	3	6	41	1	0	1	1	1	1	1

Pupil Number	Sex	Birth-Date	Soc. Eco.	Frostig 1	2	3	4	5	Sum	Kraus-Weber 1	2	3	4	5	6	No. of Tests Failed
204	1	2	2	13	14	8	4	5	44	1	0	1	1	1	1	1
219	1	1	2	17	13	3	7	6	46	1	0	1	1	1	1	1
220	1	3	2	13	17	9	7	4	50	1	1	1	1	0	0	2
223	2	1	2	14	16	8	6	4	48	0	0	1	1	1	1	2
19	2	3	2	16	18	12	5	5	56	1	1	1	0	0	1	2
22	2	1	2	15	14	0	6	6	41	0	0	1	1	1	1	2
23	2	3	2	16	14	12	7	4	53	1	1	1	1	1	1	0
24	2	2	2	11	15	13	8	7	54	1	1	1	1	1	1	0
27	2	1	2	15	19	15	6	6	61	1	1	1	1	1	1	0
109	2	2	2	13	13	7	7	5	45	1	1	1	1	1	1	0
110	2	2	2	12	15	9	7	3	46	0	0	1	1	1	1	2
111	2	1	2	15	17	14	5	3	54	1	1	1	1	1	1	0
112	2	1	2	13	10	4	5	4	36	1	1	1	1	1	1	0
113	2	4	2	12	16	7	7	4	46	1	1	1	1	1	0	1
114	2	3	2	18	16	7	8	6	55	0	0	1	1	1	1	2
118	2	4	2	13	13	3	5	2	36	1	0	1	1	1	0	2
121	2	4	2	7	2	3	4	4	20	0	0	1	1	1	0	3
129	2	1	2	10	14	3	4	4	35	1	0	1	1	1	1	1
137	2	2	2	6	9	11	6	6	38	1	0	1	1	1	1	1
139	2	3	2	16	12	9	8	6	51	1	0	1	1	0	1	2
140	2	4	2	10	18	11	7	5	51	1	1	1	1	0	1	1
141	2	2	2	19	16	11	7	6	59	1	0	1	1	1	1	1
142	2	1	2	17	12	7	7	6	49	1	0	1	1	1	1	1
143	2	3	2	18	16	11	7	5	57	1	1	1	1	1	1	0
150	2	4	2	17	15	6	6	5	49	1	0	1	1	1	1	1
151	2	2	2	14	18	7	8	6	53	1	1	1	1	1	1	0

Pupil Number	Sex	Birth-Date	Soc. Eco.	Frostig						Kraus-Weber						No. of Tests Failed
				1	2	3	4	5	Sum	1	2	3	4	5	6	
154	2	4	2	20	14	10	8	6	58	1	0	1	1	1	1	1
157	2	4	2	17	20	11	5	6	59	0	0	1	1	1	1	2
158	2	1	2	15	17	7	2	6	47	0	0	1	1	1	1	2
159	2	3	2	19	20	10	6	6	61	1	0	1	1	1	0	2
174	2	2	2	12	14	6	4	2	38	1	0	1	1	0	1	2
175	2	2	2	13	13	9	3	5	43	0	0	1	1	1	1	2
176	2	1	2	11	15	10	7	6	49	1	1	1	1	1	1	0
177	2	4	2	10	10	8	7	6	41	1	1	1	1	1	1	0
179	2	4	2	17	12	5	6	4	44	1	0	1	1	1	0	2
180	2	4	2	14	19	7	8	6	54	1	1	1	1	1	1	0
181	2	4	2	10	2	6	4	2	24	1	1	1	1	1	0	1
182	2	1	2	17	12	8	5	6	48	1	1	1	1	0	1	1
183	2	3	2	15	13	7	7	1	43	1	0	1	1	1	1	1
185	2	2	2	17	17	10	2	4	50	1	1	1	1	1	1	0
186	2	3	2	17	11	6	5	2	41	1	1	1	1	1	1	0
187	2	1	2	15	16	5	7	6	49	0	0	1	1	1	1	2
188	2	1	2	12	13	0	4	4	33	1	1	1	1	1	1	0
194	2	3	2	23	17	14	7	6	67	1	0	1	1	1	0	2
196	2	1	2	15	18	15	3	6	57	1	1	1	1	1	1	0
205	2	4	2	13	13	5	6	3	40	0	0	1	1	0	1	3
208	2	2	2	14	8	7	3	4	36	0	0	1	1	1	1	2
209	2	4	2	14	16	3	4	1	38	1	1	1	1	1	1	0
216	2	3	2	14	16	2	7	6	45	1	1	1	1	1	0	1
218	2	3	2	19	17	7	8	5	56	1	1	1	1	1	1	0

RAW DATA

FROSTIG DEVELOPMENTAL DEST OF VISUAL PERCEPTION AND KRAUS-WEBER TEST OF MUSCULAR STRENGTH AND FLEXIBILITY, DISADVANTAGED CHILDREN GROUPED BY SEX

Pupil Number	Sex	Birth Date	Soc. Eco.	Frostig 1	2	3	4	5	Sum	Kraus-Weber 1	2	3	4	5	6	No. of Tests Failed
3	2	1	1	14	16	8	6	4	48	0	0	1	1	1	1	2
6	2	3	1	14	9	5	4	3	35	1	0	1	1	1	1	1
13	2	1	1	12	4	5	2	0	23	1	0	1	1	1	0	2
14	2	4	1	6	6	2	0	2	16	1	0	1	1	0	1	2
15	2	4	1	11	15	2	2	4	34	1	0	1	1	1	1	1
16	2	2	1	4	5	6	1	0	16	1	0	1	1	1	1	1
30	2	4	1	13	19	6	7	6	51	1	1	1	1	1	1	0
36	2	3	1	13	6	7	4	3	33	1	0	1	0	0	0	4
37	2	1	1	17	15	3	7	6	48	1	1	1	1	1	1	0
38	2	1	1	4	0	5	1	0	10	0	0	0	0	0	0	6
39	2	1	1	16	9	1	5	2	33	1	1	1	1	1	1	0
40	2	3	1	18	17	8	4	4	51	1	1	1	1	1	1	0
41	2	2	1	13	4	4	6	0	27	0	0	1	0	1	1	3
42	2	4	1	13	15	6	6	2	42	1	0	1	0	0	1	3
43	2	4	1	13	10	5	6	4	38	1	1	1	1	1	1	0
44	2	1	1	17	17	8	4	5	51	1	1	1	1	1	1	0
45	2	1	1	11	13	4	2	1	31	1	0	1	1	1	0	2
46	2	3	1	11	13	13	5	3	45	1	0	1	1	1	1	1

Pupil Number	Sex	Birth-Date	Soc. Eco.	Frostig 1	2	3	4	5	Sum	Kraus-Weber 1	2	3	4	5	6	No. of Tests Failed
47	2	1	1	11	12	6	2	4	35	1	1	1	1	1	1	0
48	2	1	1	6	9	3	2	1	21	0	0	1	1	0	0	4
51	2	3	1	5	5	2	3	0	15	0	0	1	1	0	1	3
52	2	3	1	17	13	6	3	3	42	1	1	1	1	1	1	0
55	2	2	1	7	4	2	2	0	15	1	0	1	1	0	1	2
62	2	3	1	10	11	3	4	1	29	1	1	1	1	1	1	0
63	2	2	1	14	9	9	5	0	37	1	1	1	1	1	1	0
65	2	1	1	15	19	7	7	4	52	1	1	1	1	1	1	0
66	2	1	1	3	6	3	0	1	13	1	0	1	1	1	1	1
68	2	1	1	14	15	2	3	1	35	1	1	1	1	1	1	0
71	2	1	1	9	13	3	5	4	34	1	1	1	1	1	1	0
72	2	4	1	2	2	1	1	0	6	1	0	1	1	0	0	3
73	2	4	1	6	10	4	3	3	26	1	1	1	1	1	1	0
74	2	3	1	9	9	8	5	3	34	1	0	1	1	0	1	2
75	2	2	1	14	17	6	4	4	45	0	0	1	1	1	1	2
76	2	3	1	6	12	1	3	0	22	1	0	0	1	0	0	4
82	2	1	1	11	9	8	6	5	39	1	0	1	1	1	1	1
86	2	1	1	12	12	5	6	4	39	0	0	1	1	1	1	2
89	2	4	1	11	15	4	3	3	36	1	1	1	1	1	1	0
90	2	1	1	5	7	5	3	2	22	0	0	1	1	1	1	2
91	2	4	1	16	20	10	5	5	56	1	1	1	1	1	1	0
92	2	4	1	16	12	4	4	1	37	1	1	1	1	1	1	0
93	2	2	1	14	15	2	5	5	41	1	1	1	1	1	1	0
94	2	1	1	10	6	0	5	2	23	1	1	1	1	1	1	0
95	2	3	1	15	14	5	5	3	42	1	1	1	1	1	1	0

Pupil Number	Sex	Birth-Date	Soc. Eco.	Frostig						Kraus-Weber						No. of Tests Failed
				1	2	3	4	5	Sum	1	2	3	4	5	6	
164	2	4	1	9	1	4	1	0	15	0	0	1	0	1	0	4
165	2	4	1	10	12	4	2	4	32	0	0	1	1	1	1	2
168	2	3	1	10	16	7	5	4	42	0	0	1	1	1	0	3
222	2	2	1	5	8	5	3	2	23	1	0	1	1	1	1	1
1	1	2	1	8	2	3	0	0	13	0	0	1	1	1	0	3
2	1	2	1	12	9	1	5	2	29	1	1	1	1	1	1	0
4	1	2	1	8	16	2	3	4	33	1	1	1	1	1	1	0
7	1	2	1	4	14	7	4	5	34	0	0	1	1	1	1	2
8	1	4	1	7	7	7	1	1	23	1	0	1	0	0	0	4
9	1	3	1	9	5	0	5	3	22	1	1	1	1	1	0	1
10	1	3	1	9	6	2	3	4	24	1	1	1	1	0	1	1
11	1	4	1	13	14	4	3	5	39	0	0	1	1	1	1	2
31	1	4	1	13	10	3	7	3	36	1	1	1	1	1	1	0
33	1	3	1	14	16	8	4	0	42	0	0	1	1	1	0	3
34	1	4	1	4	3	4	4	0	15	1	1	1	1	1	1	0
35	1	4	1	12	18	4	5	4	43	0	0	1	1	1	1	2
50	1	3	1	0	1	0	0	0	1	1	1	1	1	1	1	0
53	1	3	1	8	9	8	3	2	30	1	1	1	1	1	0	1
56	1	1	1	6	11	5	3	1	26	1	1	1	1	1	1	0
57	1	3	1	5	4	2	2	1	14	1	1	1	1	1	1	0
58	1	4	1	9	7	0	3	1	20	1	1	1	1	1	1	0
59	1	4	1	8	4	3	5	1	21	1	0	1	1	0	1	2
60	1	4	1	10	9	3	1	0	23	1	1	1	1	1	1	0
61	1	3	1	7	5	0	1	1	14	1	1	1	1	1	1	0
64	1	1	1	12	13	7	5	5	42	1	1	1	1	1	0	1

Pupil Number	Sex	Birth-Date	Soc. Eco.	Frostig						Kraus-Weber						No. of Tests Failed
				1	2	3	4	5	Sum	1	2	3	4	5	6	
67	1	1	1	7	3	1	2	0	13	1	1	1	1	1	1	0
69	1	4	1	12	8	6	3	2	31	1	0	1	1	1	1	1
70	1	4	1	12	5	1	1	0	19	1	0	1	1	1	0	2
77	1	4	1	17	10	4	4	1	36	1	0	1	1	0	1	2
80	1	3	1	5	1	0	3	1	10	0	0	1	1	0	0	4
83	1	1	1	5	6	8	3	3	25	1	0	1	1	1	1	1
84	1	1	1	14	8	9	4	4	39	0	0	1	1	1	1	2
87	1	1	1	13	8	3	2	2	28	1	1	1	1	1	1	0
88	1	2	1	11	18	2	3	3	37	1	1	1	1	1	1	0
96	1	2	1	9	1	2	0	1	13	0	0	1	1	1	0	3
97	1	3	1	12	13	4	5	0	34	1	0	1	1	1	0	2
98	1	4	1	5	8	5	1	1	20	1	1	1	1	0	0	2
99	1	3	1	9	17	0	2	4	32	1	1	1	1	1	1	0
100	1	4	1	4	1	0	1	0	6	1	1	1	1	1	1	0
101	1	3	1	7	11	5	5	1	29	1	1	1	1	1	1	0
102	1	1	1	7	14	5	5	4	35	0	0	0	1	0	0	5
127	1	2	1	14	2	5	2	1	24	1	0	0	1	1	1	2
130	1	2	1	11	4	7	1	1	24	1	1	1	0	1	1	1
132	1	3	1	12	4	3	1	1	21	0	0	1	1	0	1	3
134	1	1	1	10	8	1	4	5	28	0	0	1	1	1	1	2
136	1	3	1	13	6	6	8	2	35	1	1	1	1	1	1	0
170	1	4	1	8	15	3	1	3	30	0	0	1	1	1	0	3
171	1	2	1	12	11	7	2	3	35	1	0	1	1	0	0	3
213	1	3	1	5	5	3	1	3	17	0	0	0	0	0	0	6
214	1	2	1	5	8	2	2	1	18	1	0	1	1	1	1	1
221	1	1	1	13	12	7	3	2	37	1	0	1	1	0	1	2

APPENDIX H

FREQUENCY TABLE FOR KRAUS-WEBER COMPOSITE SCORE

FREQUENCY TABLE FOR KRAUS-WEBER
COMPOSITE SCORE

Number of Tests Failed	Disadvantaged		Nondisadvantaged	
	Girls	Boys	Girls	Boys
0	20	17	17	17
1	7	8	12	13
2	10	12	16	10
3	5	6	2	4
4	4	2	0	2
5	0	1	0	1
6	1	1	0	0
Total	47	47	47	47

APPENDIX I

GUIDE FOR RATING OCCUPATION

GUIDE FOR RATING OCCUPATION

Rating	Professionals	Proprietors and Managers	Business Men
1	Lawyers, doctors, dentists, engineers, judges, high school superintendents, veterinarians, ministers (graduates of divinity school), chemists, etc. with post-graduate training, architects	Businesses valued at $225,000	Regional and divisional managers of large financial industrial enterprises
2	High-school teachers, trained nurses, chiropodists, chiropractors, undertakers, ministers (some training), newspaper editors, librarians, (graduate)	Businesses valued at $60,000 to $225,000	Assistant Managers and office and department managers of large businesses, assistant to executives, etc.
3	Social workers, grade-school teachers, optometrists, librarians, (not graduate), undertaker's assistants, ministers (no training)	Businesses valued at $15,000 to $60,000	All minor officials of businesses
4	None	Businesses valued at $6000 to $15,000	None
5	None	Businesses valued at $1500 to $2000	None
6	None	None	None

GUIDE FOR RATING OCCUPATION
Continued

Rating	Clerks and Kindred Workers	Manual Workers	Service Workers
1	Certified Public Accountants	None	None
2	Accountants, salesmen of real estate, of insurance, postmasters	None	None
3	Auto salesmen, bank clerks and cashiers, postal clerks, secretaries to executives, supervisors of railroad, telephone, etc., justices of the peace	Contractors	None
4	Stenographers, bookkeepers, sales people in stores, etc.	Factory foremen, electricians, plumbers, carpenters, watchmakers	Dry cleaners, butchers, sheriffs, railroad engineers and conductors
5	Dime store clerks, hardware salesmen, beauty operators, telephone operators	Carpenters, plumbers, electricians, timekeepers, linemen, telephone or telegraph, radio or TV repairman, medium-skill workers	Barbers, firemen, butchers, apprentices, practical nurses, policemen, seamstresses, cooks, bartenders
6	None	Moulders, semi-skilled workers, assistants to carpenters, etc.	Baggage men, night policemen, watchmen, taxi and truck drivers, gas station attendants, waitresses

GUIDE FOR RATING OCCUPATION
Continued

Rating	Clerks and Kindred Workers	Manual Workers	Service Workers
7	None	Heavy labor, migrant work, odd-job men, miners	Janitors, scrubwomen, newsboys, etc.

APPENDIX J

GUIDE FOR RATING HOUSE TYPE

GUIDE FOR RATING HOUSE TYPE

1. Large houses in good condition

2. Large houses in medium condition

3. Large houses in bad condition

4. Medium-sized houses in medium condition; apartments in regular apartment buildings

5. Small houses in good condition; small houses in medium condition; dwellings over stores

6. Medium-sized houses in bad condition; small houses in bad condition

7. All houses in very bad condition; dwellings in structures not originally intended for homes