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I am submitting herewith a dissertation written by Carolyn Marie Hall entitled "A Developmental Screening Test: Development, Validation, and Implementation." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Curriculum and Instruction.

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A DEVELOPMENTAL SCREENING TEST: DEVELOPMENT, VALIDATION, AND IMPLEMENTATION

A Dissertation

Presented for the

Doctor of Education

Degree

The University of Tennessee, Knoxville

Carolyn Marie Hall

December 1978

1371139

DEDICATION

This dissertation is dedicated to the memory of a loving, caring and intelligent woman, Ruth Craig Hall Goldsby, who was an impetus to everyone, especially her family. She instilled in them the value of knowledge. Because of her constant encouragement her children are now successful learned persons.

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ABSTRACT

In 1975 the North Carolina General Assembly appropriated funds to develop and implement a Statewide Prekindergarten Screening Program (SPSP) for the 1975-77 biennium. The major purpose of the program was to identify developmental disabilities of four-year-olds during the year before their entrance into kindergarten. Phase I screening involved the administration of the North Carolina Psychoeducational Test (PET). The PET was the most important factor in determining whether a child should be referred for Phase II screening which involved the administration of the McCarthy Scales of Children's Abilities (MSCA). The PET's ultimate purpose was to identify children with the most serious deficiencies. However, studies indicated that the PET was identifying a large percentage of children as needing Phase II screening when, in fact, they did not. More specifically, approximately 50 percent of the referrals were false positives. A more discriminating diagnosis in Phase I screening would not only save manpower and administrative costs but also would save parents the time required for additional follow-up screening.

The purpose of this study was to develop a reliable and valid screening instrument which, when compared with the North Carolina Psychoeducational Test, would be a more sensitive instrument and would reduce the number of four-year-old children inappropriately referred for Phase II screening. The study required the selection of test items, development of test format, piloting of test, revision of the test, and

statistical analyses based on its administration to a sample of children from northwestern North Carolina.

A comprehensive survey of developmental and preschool tests was conducted to determine which test items might serve as good indicators of developmental functioning for five age groups. Sixty items were chosen to be included on the screening test. These items were selected from twelve preschool developmental and screening tests. The items were divided into six functional areas: visual memory, auditory memory, gross motor development, visual motor performance, language development, and concept development. In each of these areas there were ten items, two for each of the five age groups.

Forty-six children were tested in the pilot study. The children ranged in ages from two and one-half years to five and one-half years. An attempt was made to include children representative of both sexes, black and white children, and children from a wide range of socio-economic groups. The percentage of children passing each item was determined. Items which were not passed by 75 percent of the children were examined and revised or replaced with other items. The final revision of the instrument included sixty items, ten in each of the developmental areas.

Eighty-six children were involved in the norming sample. In each age group the percentage of children who passed each item was calculated. The level of item difficulty was determined by computing the relationship between each item and the total score using a point biserial. Consideration was given to the percentage of children passing

each item according to race, sex, and occupational level of the child's mother and father. The sample was compared to the general population in northwestern North Carolina in regard to sex, race, and occupational groups using a chi-square test.

Determination of the reliability of scoring by the examiners was made using a Fisher Exact Test and two measures of association—the phi coefficient and the contingency coefficient.

The validity of the screening instrument was computed using the Kuder-Richardson$_{20}$ and the split-halves method. Thirty-one children were selected for the validity study. They were tested with the screening instrument and the McCarthy Scales of Children's Abilities. A chi-square, a phi coefficient and the contingency coefficient were used to determine the correlation between each of the six functional areas of the screening instrument and the five functional areas of the MSCA. The correlation between the total scores of the two instruments was also computed.

The comparative study involved the comparison of scores on the screening instrument with scores on the PET. The purpose of this comparison was to determine the extent the screening instrument and the PET correlated with the MSCA. A sample of sixteen children was administered the screening instrument, the PET, and the MSCA. Scores were compared to determine which test made a more accurate decision in referring children for further diagnostic testing.

The results of the norming study indicated that nine out of the sixty items were not passed by 75 percent of the children. Nine of

these sixty items had negative point biserials. There was no significant difference in the percentage of blacks and whites passing the items except on one item. There was no significant difference in the percentage of males and females passing the items except for one item in one age group. Only minor differences were calculated in the way the children answered the items when categorized according to occupational group of both father and mother.

No relationship between the examiners and their ratings was found, indicating that the ratings of the examiners were consistent. Using the Kuder-Richardson$_{20}$ a reliability of .938 was computed. The split halves statistical method computed a R of .8731 which when converted to a reliability coefficient was .932.

A chi-square value of 6.09524 was computed when the total score of the screening test was compared with the total score of the MSCA. This was significant at the .0136 level.

The results of the comparative study indicated that the screening instrument correlated significantly with the MSCA at the .001 level. The PET correlated significantly at the .01 level. An individual analysis of the sixteen test administrations indicated that the screening test was more sensitive than the PET. Decisions to refer or not to refer were correct in more cases using the screening test rather than the PET.

To summarize, the major conclusions of this study were:

1. The majority (fifty-one out of sixty) of the items on the screening instrument were passed by 75 percent of the population for which they were designed.

2. The screening test had a high interrater reliability.

3. The screening instrument when compared to a valid and reliable instrument was also found to be a valid instrument.

4. The screening test, when compared with the PET, appeared to be a more sensitive instrument, allowing examiners to make decisions regarding referral for further testing with a greater degree of confidence.

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CHAPTER I

INTRODUCTION TO THE STUDY

I. INTRODUCTION

The Office for Child Development published a document in 1974 entitled The State of Young Children in North Carolina. This document provided, for the first time, a comprehensive view of developmental disabilities in children under six years of age. It stated that in 1974 there were approximately 90,981 children under the age of six who were handicapped and, of these, an estimated 21,000 children entered kindergarten each year with a developmental disability. Using percentages supplied by the Division of Exceptional Children, State Department of Public Instruction, it was estimated that out of 319 four-year-old children in a one county area there were twelve mentally retarded children (3.9 percent), ten learning disabled children (3.0 percent), twenty-one children with speech and hearing impairment (6.5 percent), two crippled children (0.5 percent), one visually impaired child (0.2 percent), and ten emotionally disturbed children (3.0 percent) (North Carolina Office of Child Development, p. 25).

In response to these findings the 1975 North Carolina General Assembly appropriated over three and one-half million dollars to develop and implement a Statewide Prekindergarten Screening Program (SPSP) during the 1975-77 biennium. The purpose of this program was: (1) to determine the strengths and weaknesses of four-year-olds during the year

before their entrance into kindergarten, (2) to counsel with parents and other child care workers and to assist them in meeting the special needs of each child, and (3) to plan with community child care professionals to focus services around the needs of individual children and families (North Carolina Department of Human Resources, 1975).

As a result of the screening program, each family was offered Phase I screening which included:

1. an explanation of the screening process, completion of consent forms and an explanation of confidentiality policies;
2. the screening of the child's vision and hearing;
3. the administration of the North Carolina Psychoeducational Test (PET);
4. the administration of the Bean Bucket Game to assess the social and emotional maturity of the child;
5. a parent interview conducted by a screening counselor;
6. an analysis and summarization of all information gathered, followed by a conference with the parents. (North Carolina Department of Human Resources, 1975)

When no deficiencies were identified and the child appeared to be functioning at the four-year age level, the family was given enrichment materials which were recommended for use with the child. If, on the other hand, the child appeared to have special needs which needed further attention the family was then offered Phase II screening.

Phase II screening included the administration of the McCarthy Scales of Children's Abilities (MSCA), along with an in-depth interview and interpretation of results to the parents. If Phase II screening indicated that the child appeared delayed then appropriate intervention was recommended. The screening counselor would share the test results of both Phase I and Phase II screening with the child's parent, his/her

current preschool teacher, and the kindergarten teacher in the school the child would be attending the following year.

The PET was the most important factor in determining whether a child should be referred for Phase II screening. The instrument was developed by the North Carolina Department of Human Resources in the Division of Health Services. It focused on seven distinct areas of functioning: gross motor, visual memory, auditory memory, auditory perception, visual motor integration, concept development, and language development. The PET was a screening instrument rather than a diagnostic test; however, it identified both advances and delays in the child's development in all of the developmental areas listed above, except for the gross motor area where only delays are identified.

The PET's primary purpose was to identify children with the most serious deficiencies. Estimates of children with handicaps ranged from 8 percent (Cronbach, 1960) to 40 percent (Rogolsky, 1969). One comprehensive program designed to locate, screen, and evaluate handicapped preschool children identified approximately 13.7 percent of the population as having the most serious deficiencies. The PET was designed to identify what had been approximated to be 10 to 15 percent of the four-year-old population that was in need of special services. Ultimately, however, studies indicated that the PET was identifying a large percentage of children as needing further testing and/or special services.

II. STATEMENT OF THE PROBLEM

In studies conducted in Boone and Raleigh, the use of the criterion of one delay on the PET resulted in 66 percent of the children in Phase I being referred for Phase II screening. The criterion for referral was then changed to two delays in any of the seven developmental areas. Using this criterion, 37 to 50 percent of the four-year-old population were referred for Phase II screening. More significantly, statistics indicated that approximately 50 percent of Phase II referrals were false positives. That is, the children scored "not yet" on the PET used in Phase I screening, but normal on the McCarthy Scales of Children's Abilities, the diagnostic tool used in Phase II screening. The elimination of the large number of false positives was a major concern of the screening staff.

If this study succeeds in developing a more sensitive instrument for Phase I screening, a considerable amount of money and manpower will be saved. In North Carolina, one screening team of six persons screened 1,200 children a year at an operating expense of $180,000—a cost of $150 per child. If the number of false positives in this program could be reduced by 10 percent from its high current estimate of about 40 to 50 percent, the cost of screening per child would be reduced.

III. PURPOSE OF THE STUDY

The purpose of this study was to develop a reliable and valid screening instrument which, when compared with the North Carolina Psychoeducational Test, would be a more sensitive instrument and would

reduce the number of four-year-old children requiring further diagnostic testing. Developing a valid and reliable instrument would require the following:

1. The selection of test items which would measure the developmental functioning of children in five age groups: two years and six months to three years, three years to three years and six months, three years and six months to four years, four years to four years and six months, and four years and six months to five years;
2. The conduction of validity and reliability studies on the test items; and
3. The execution of a comparative study utilizing the screening instrument and the PET to determine which instrument would reduce the number of children inappropriately referred for further testing.

IV. IMPORTANCE OF THE STUDY

In its original form the PET revealed only if the child were performing at the four-year age level. The screening test developed by this investigator, with additional test items for the younger age groups, would enable screeners to test downward in any area of developmental functioning. Thus screeners could make decisions concerning referral to Phase II with more confidence. A more discriminating diagnosis in Phase I screening would not only save manpower and administrative costs but also would save parents the time

required for additional follow-up screening and would avoid alarming the family unnecessarily.

V. LIMITATIONS OF THE STUDY

The limitations of this study were:

1. The population of this study was limited to preschool children in northwestern North Carolina.
2. The population was not representative of all social, economic, and racial groups.
3. The subjects in this study were not randomly selected.
4. The subjects selected for the study were limited to those whose parents gave permission for the child to participate and were willing to arrange screening sessions with the investigator.

VI. ASSUMPTIONS

Assumptions for this study are:

1. A reliable and valid screening instrument can be developed which, when compared with the PET, would reduce the number of four-year-old children requiring follow-up testing.
2. The six functional areas represented in the instrument are assumed to be necessary for normal development.

VII. DEFINITION OF TERMS

Auditory memory scale. The auditory memory items measure the child's ability to remember (what he hears), such as a series of digits, three commands, or several sentences.

Auditory perception scale. The auditory perception items measure the child's ability to identify common sounds, such as hands clapping, a bell ringing, or words that begin with the same sound.

Concept development scale. Concept development items measure the child's ability to notice similarities and differences demonstrating his perceptual understanding of relationships of length, of size, of shape, and of design.

False positive. False positive is a term used to describe a subject who scored delayed on the PET, used in Phase I, but normal on the McCarthy Scales of Children's Abilities used in Phase II.

Gross motor scale. The gross motor items measure a child's coordination and balance, such as the ability to balance on one foot and to hop on one foot.

Language development scale. The language development items measure the child's ability to provide basic identifying information about himself, about familiar objects, and about familiar properties of objects.

Visual memory scale. The visual memory items measure the child's ability to remember what he has seen. This is done by having him reconstruct a series of colors in the correct order or identify an object which has been removed from a group of objects.

Visual motor integration scale. The visual motor items measure the child's ability to coordinate his visual and manual skills. Examples of visual motor performance items include requiring the child to copy a cross and a triangle, draw a man, and grip a pencil adequately.

Phase I screening. Phase I screening is the initial screening process consisting of a parent interview, the administration of the PET, Bean Bucket Game, and vision and hearing examinations.

Phase II screening. Phase II screening is follow-up screening involving the administration of the McCarthy Scale of Children's Abilities, a diagnostic instrument.

Screening test. The term screening test refers to the instrument which was developed by this investigator.

VIII. ORGANIZATION OF THE STUDY

Chapter I introduces the problem, states the problem, states the purpose of the study, states the importance of the study, states the assumptions, and defines the terms used.

Chapter II presents a review of the related literature and a review of the tests which contain items that appear on the screening test.

Chapter III describes the procedure used in collecting the data and the statistical methods used in analyzing the data.

Chapter IV presents the results of the study.

Chapter V contains a general summary, the findings of the study, and the conclusions and recommendations drawn from the study.

CHAPTER II

REVIEW OF RELATED LITERATURE

I. INTRODUCTION

The purpose of this study was to develop a reliable and valid screening instrument which, when compared to the North Carolina Psychoeducational Test, would be a more sensitive instrument and would reduce the number of four-year-old children requiring further diagnostic testing. This chapter describes some of the approaches which have been taken in the screening and testing of young children. A definition of screening and a history of screening is presented. A brief review of medical screening is presented along with a review of tests used in the medical community. The transition from medical screening to the comprehensive screening of children, which includes an educational component, is presented. The last section is devoted to a description of the developmental and preschool tests which contain items that appear on the screening test developed by this investigator. The validity, reliability, and normative data relating to each of these tests are presented.

II. DEFINITION OF SCREENING

The concept of screening as a method for early identification of children who might exhibit physical, emotional, or intellectual deficiencies in development appears throughout the medical literature.

There are two primary methods for early identification—the identification of "high risk" families and the diagnostic screening of children. This chapter is concerned with the diagnostic screening of children and the development of an instrument which can be used in a comprehensive screening program to identify the strengths and weaknesses in young preschool children.

Although various definitions of screening exist in the literature, accepting one definition would provide a basis for evaluating programs and instruments used in screening. The North Carolina's Governor's Advisory Council on Comprehensive Health Planning issued a report defining screening as "the use of economical and easily applied tests, examinations, and procedures for the purpose of finding whether or not disease or defects exist among apparently well persons" (Lessler, p. 192).

Lessler (1972) in an article on health and educational screening writes that any definition of screening should include a broadened definition of health. A reference to the relevance of the screening to the child's life should be included. He proposed the following definition of screening for adoption:

> Screening is the acquiring of preliminary information about characteristics which may be significant to the health, education, or well-being of the individual and which are relevant to his life tasks. The means of data collection must be appropriate and reasonable with regard to the economics of time, money, and resources for dealing with large numbers of persons. (Lessler, p. 193)

III. HISTORY OF SCREENING

Screening children for early identification of diseases and handicaps appears in both the medical and educational literature. Ingram (1969), describing a new approach to an early diagnosis of handicaps in children, makes the point that in the past the onus of recognizing that a baby was abnormal fell upon the parents. He pointed out that many parents had no reason to suspect the presence of abnormality in their children, that they were unskilled in recognizing such abnormalities, and that they were often unwilling to acknowledge them when they were observed. As a result, they often procrastinated in seeking medical advice and their handicapped children did not receive the remedial treatment necessary for their development. Ingram states that the onus of recognizing early that a child is abnormal no longer rests with the parents alone, but it is now the responsibility of the family doctors, pediatricians, public health nurses, and other health officials. Ingram also points out that the identification of "high risk" babies could be made in many cases before conception or during the pregnancy, labor, and delivery of the child (p. 280).

Sheridan (1969), agreeing with the proponents of early identification, states that the aim today is to detect babies "at risk" of suffering from handicaps and thus possibly avoid the worst effects of the condition found. Sheridan believed that the names of children with a family history of disease or children whose mothers had abnormalities in the perinatal period should be kept in a risk register for future follow-up (Meier, pp. 127-128). This focus on the early recognition of

handicaps in childhood and the diagnosis of these handicaps has gradually replaced the previously held concept of diagnosis after the age of school entrance when little intervention or remediation is available for handicapped children.

One approach to the implementation of this idea is described by Wulcan (1973). This approach is referred to as First Identification of Neonatal Disabilities (F.I.N.D.), and it was designed to aggressively provide services as early as possible in the handicapped child's life. The identification of the retarded child depended on the diagnosis by a physician soon after the birth of the child. Following the physician's initial screening and identification, the child was referred to F.I.N.D. where the family would then receive counseling support, information regarding resources available for the handicapped children, and a homebound service (Meier, p. 128).

In the 1960's and early 70's the emphasis on early detection of handicaps began to gain support. In 1971 the State of Kansas implemented a pilot program to identify three- and five-year-old children with vision and hearing problems. This program was medically oriented at first but soon expanded. Additional screening techniques were added to the program so that the clinics were detecting other deficiencies besides physical handicaps (i.e., sensory deficiencies; mental retardation; emotional and behavioral disorders; and physical, social, and cultural deprivation). A more comprehensive screening program was developed which included the Denver Developmental Screening Test, in addition to the hearing and vision tests previously used in

the program. It was administered along with speech and vocabulary screening tests (Meier, p. 132).

Thus, screening for educational handicaps gradually came into being in the medical community. Clinics and health departments quickly saw the importance of educational screening and how closely related it was to screening for physical handicaps. In the early seventies, however, screening was haphazard and little structure existed in most programs.

A comprehensive and elaborate model for implementing a screening system was presented by Scurletis and Hendrick (1972). Their system of comprehensive health care screening and services for children provided a community with a total system for identifying and coordinating services for handicapped children. They saw screening as an intimate part of the process at every point in their system. Screening was the crucial component which helped to identify the "high risk" inactive patient at the community level (Meier, p. 129).

Since 1967, the Permanete Medical Group at the Kaiser Foundation Hospital in San Francisco has been conducting a model pediatric multiphasic program for children over four years of age. A series of screening tests are administered along with a thorough physical examination. Intelligence tests, including screens for various learning disabilities and drawing tests (e.g., Draw-a-Person and the Bender-Gestalt) are administered to detect perceptual-motor and conceptual deficiencies. The components of this model which contribute to its being a model screening program are: the inclusion of a thorough medical examination, the administration of various tests to assess

developmental functioning, the use of tests relating to psychological development and behavior problems, and the use of a computer to process and store the results of all screening (Meier, p. 138).

Following a lengthy position paper by Lessler (1972), which delineated the necessary components of a screening program and the paper written by Scurletis and Hendrick describing their model for comprehensive screening, the Governor's Study Commission on the Public School System in North Carolina released a study emphasizing the need for a comprehensive screening program in North Carolina. In 1975, the North Carolina legislature mandated that every four-year-old be screened before entrance to kindergarten. Three and one-half million dollars was then appropriated by the North Carolina legislature for the purpose of developing and implementing a statewide prekindergarten screening program. Pilot programs began in two areas—one in a rural mountainous areas and the other in an urban area in the Piedmont region. Other pilot programs soon developed across the state. The screening program could not be referred to as a comprehensive program because a medical component was not included in the primary screening. The screening was primarily educational in nature. The primary screening test was the Psychoeducational Test which was developed using items on existing inventories.

IV. MEDICAL SCREENING TESTS

Since most comprehensive screening programs contain provisions for assessing the developmental progress of children it is important to

consider some of the instruments available for primary screening. Well known scales developed by Bayley, Binet, Cattell, Doll, Gesell, Griffiths, Wechsler, and others concentrate on an in depth assessment of one or two factors in the developmental domain. These instruments require considerable time to administer, score, and interpret (Meier, p. 143). In primary screening it is desirable to utilize an instrument which is inexpensive and quick to administer and can be easily administered by paraprofessionals or persons who have little training in testing. There are five primary screening tests that are used frequently by the medical community in comprehensive screening programs. A description of these tests follows:

The Rapid Developmental Screening Checklist is a one page checklist consisting of forty items which cover the age range of one month to five years. This simple checklist was developed by the New York Chapter of the American Academy of Pediatrics. The checklist is a compilation of developmental landmarks matched against the age of the child. The questions are easily scored "yes" or "no" by the physician or nurse. "No" responses at an appropriate age may constitute a possible developmental lag. The checklist contains such items as: "Can he build a tower of six blocks? Can he copy a circle? Can he stand on one foot? Can he follow two commands involving 'on,' 'under,' or 'behind'?" (Meier, pp. 143-144).

Another developmental screening instrument, the Developmental Screening Inventory (1967), screens children twenty-one weeks to eighteen months of age. The instrument, developed by Knobloch,

Pasamanick, and Sherard, determines a level of functioning by asking the parents of the infant questions or by observing the infant's behavior. The Developmental Screening Inventory correlates very highly with the Gesell Developmental and Neurological Examination from which some of the items were selected and adapted. The test is devided into five areas of behavior: adaptive, gross motor, fine motor, language, and personal social. Some of the items appearing in the eighteen month range are: Dumps crumb out of bottle when demonstrated; Turns pages of book, two or three at a time; Uses spoon to feed, while spilling a bit; and Stacks three small toys (Meier, pp. 150-151).

The Guide to Normal Milestones of Development was designed by Haynes (1967) for use by nurses dealing with infants and newborn children with developmental problems. The instrument takes the form of a wheel device and contains information relating to the various reflexes which are exhibited by infants as well as behaviors exhibited by children ages one month to thirty-six months. The guide is meant to reinforce the basic knowledge and clinical expertise of nurses and teachers. The wheel also contains the major milestones of development at each age according to the Cattell, Griffiths, and Caldwell and Draehmans scales. The back of the wheel contains "indexes of suspicion" which are indications to the tester that medical attention is needed (Meier, pp. 145-147).

The CCD Developmental Progress Scale was developed by Boyd (1969) for the purpose of portraying the developmental level of functioning of young children, on a one page, easy-to-read chart. The level of

functioning of young children from birth to eight years of age is measured in the following areas: motor skills, interpersonal-communication skills, and self-sufficiency skills. The scale is simple to administer and does not require any specialized training. Boyd researched other developmental instruments before determining which should be included in the scale. Items from other tests were not included on the scale unless 50 to 75 percent of the children of that age level demonstrated that skill. The author assumes essential validity of the total instrument since each item in previous research had been proven to have developmental validity. Secondly, no item was selected unless it possessed what Boyd referred to as "survival value," that is, it was a prerequisite for, or led to, the development of later behaviors which improved the efficiency of living. Examples of items on the CCD Scale are as follows: Alternates feet while walking down stairs; Plays outdoors safely; Separates without a fuss; Plays competitive games; Washes own face; and Blows own nose (Meier, pp. 154-157).

Commenting on the status of developmental scales for the screening and assessment of young children, including the four scales discussed above, Meier states that:

> A review of the literature indicates that validity and reliability studies done on developmental scales are not widely undertaken or reported and the results are frequently not impressive. An outstanding exception to this is the Denver Developmental Screening Test which has been subjected to extensive and intensive reliability and validity studies. (p. 156)

Most of the reliability and validity studies conducted on the Denver Developmental Screening Test (DDST) are generally supportive of the

instrument in terms of face and concurrent validity. However, Sandler (1972) after researching the DDST indicated that the predictive validity of the DDST with minority ethnic groups and disadvantaged children is very low (Sandler et al.). A complete review of the DDST is offered later in this chapter.

V. EDUCATIONAL SCREENING TESTS

Educators are more familiar with screening readiness tests such as the Metropolitan Readiness Test, the Macmillian Reading Readiness Test, and the Lee-Clark Readiness Test. Readiness tests have been used for years to screen children prior to first grade entrance. The Seventh Measurements Yearbook (Buros, 1972) contains an expanded section on recently developed readiness tests. The purpose of most of these readiness tests is to determine whether a child, after entering the first grade, is ready to begin a formal reading program. With the advent of comprehensive kindergartens the use of screening tests prior to kindergarten has become popular. A large number of screening tests exist that were developed to screen kindergarten children in various areas. These tests range from quick tests that take less than ten minutes to more extensive screening requiring several sessions.

One of the simplest and quickest instruments is the Preschool Screener developed by Winett et al. (1969). The Preschool Screener was developed to tap school related skills in children three to five and one-half years of age. The test contains only fifteen items and takes less than ten minutes to administer. The test was normed on a sample of

124 children and has a Kuder Richardson Formula$_{20}$ of .726. The Preschool Screener has a statistical correlation of .77 with the Peabody and .74 with the Illinois Test of Psycholinguistic Abilities Scale. A quick review of the items on the test indicates that it does contain items relating to the identification of letters and numbers which, in and of itself, is a good test of visual discrimination and a high predictor of success in reading (Winett et al., p. 110).

Many other preschool tests are available and found to be generally less reliable than tests for older children. Results of studies on preschool screening tests indicate that scores obtained appear to be unstable over time (Bayley).

VI. DEVELOPMENTAL TESTS CONTAINING ITEMS USED IN SCREENING TEST

The last section of this chapter is devoted to a description of the developmental and preschool tests containing items which appear on the screening test developed by this investigator. Each test is reviewed for its usefulness in testing young children. Special consideration is given to whether the items are appropriate for the ages designated. The validity, reliability, and normative information for each test are also reviewed. Studies which were conducted to replicate original validity, reliability, or normative data on the instruments are also included in this review.

Bayley Scales of Infant Development (BBID)

The BBID was developed for children ages two to thirty months for the purpose of establishing a child's current developmental status and

thus the extent of any deviation from normal expectancy. The test is divided into three parts: mental, motor, and behavioral. The test draws heavily on the California First-Year Mental Scale, the California Preschool Mental Scale, and the California Scale of Motor Development. The mental scale is made up of 163 items. The scales are valuable in establishing an infant's current developmental status in relation to others his age. It is not a good predictor of a child's abilities in later life (Bayley, 1969).

The BSID was carefully standardized on 1,262 infants and children ranging from two to thirty months of age. The sample was representative of the United States population in terms of geographic location, residence, sex, race, and education of the head of household. The split-halves reliability coefficients reported for the fourteen age groups range from .81 to .93 on the mental scale and from .68 to .93 on the motor scale. The validity of the mental scale was determined by correlating the scores of the two-year-olds on the BSID with their scores on the Stanford Binet Intelligence Scale. The correlation was .57 for the six months age overlap of the two tests. No validity information is available for children younger than two. The range of items in the Bayley and the reliability of its scales and their careful construction and standardization make the BSID one of the best measures of infant development available today (Buros, pp. 728-729).

Carolina Developmental Profile

The Carolina Developmental Profile is a criterion referenced behavior checklist designed to use with an instructional system. The

profile is designed to help teachers establish long range objectives to increase developmental abilities in six areas: fine motor, gross motor, visual perception, reasoning, receptive language, and expressive language. The Carolina is not meant to be used as a standardized assessment instrument. Rather it was designed to help teachers determine what tasks the child can and cannot accomplish, for purposes of individualizing the child's program. The authors of the Carolina caution those who use the four age levels as a diagnostic label (i.e., the child is functioning at the four year level in fine motor development). The authors state that it is more important to find out if a child can complete a task, how easy it was to complete, or, if the child couldn't accomplish the item, how close was he to accomplishing the task (Lillie, 1975).

Items for the Carolina were selected from several other developmental tests: The Alpern Ball, the Bayley Scales of Infant Development, the Boehm Test of Basic Concepts, the Bzoch-League Receptive-Expressive Emergent Language Scale, the Preschool Inventory, the Vineland Social Maturity Scale, the Denver Developmental Screening Test, and the Oseretsky Test of Motor Proficiency (Lillie, 1975).

The Cooperative Preschool Inventory

The Cooperative Preschool Inventory was developed by Betty Caldwell in the early sixties for the purpose of screening headstart children. The inventory was designed for disadvantaged children ages three to six years and was to measure achievement in the areas regarded as necessary for success in school. Caldwell needed an instrument to

record baseline data on the children entering the headstart program which could be administered at the end of the headstart experience to show program gains. The instrument can be administered individually and does not require a great deal of equipment or time for administration. The preschool inventory is considered to be an educational test developed to evaluate the performance of individual children and to help teachers formulate an individualized plan of instruction.

The items on the test were arranged into six subtests to measure performance in the areas of basic information and vocabulary; number concepts and ordination; concepts of size, shape, motion and color; concepts of time; object class; and social functions (Caldwell, p. 7).

The first version of the Inventory was normed on 389 subjects. An item analysis was completed using a biserial r and by computing the percentage of children passing each item. The revised 1970 edition containing sixty-four items was normed on 1,531 children who were tested in headstart centers in various parts of the United States. In addition to the national norms for the five age groups, regional norms were provided for some areas where over 100 children were tested. Percentile ranks were computed for each age group and for each of the regions used in the norming study (Caldwell, p. 10).

Kuder Richardson's reliability coefficient for the age groups ranged from .86 to .92. The Stanford Binet Intelligence Scales were used as a criterion instrument in the validity study. Concurrent validity coefficients vary from .39 at age three years to three years and eleven months to .65 for ages five years to five years and five months (Buros, p. 731).

The test has a strong verbal emphasis but is relatively light on tasks such as short term memory, motor development, and visual perception. Only four items on the test deal with these categories. Carlson, reviewing the Inventory in Buros, states:

> Unfortunately, there are no indications of the relationships between CPSI scores and other criteria, either concurrently with another preschool test, or predictively with such crucial variables as success in beginning reading. Focusing on the author's preference that it be considered an achievement test, the content validity picture is just as bleak. (Buros, p. 732)

Carlson summarizes his feelings about the Cooperative Preschool Inventory by stating that the test was hastily marketed with inadequate norms and meager reliability and validity data (Buros, p. 732).

Denver Developmental Screening Test (DDST)

The DDST is a developmental screening test for young children ages two weeks to six years. The DDST was developed to meet the need of having a simple useful screening test to aid in the early discovery of children with developmental problems. The test was designed for use by paraprofessionals or persons who have not had special training in psychological testing (Frankenburg and Dodd, p. 2).

The DDST is made up of 105 items or tasks which fall in the range of accomplishments of children from birth to six years. These items were arranged into four areas of functioning: gross motor, fine motor, language, and personal social. The items were selected from twelve existing developmental and preschool tests and were administered to a standardized population of 1,036 children from the Denver, Colorado, area. Calculations were made showing the age at which 25, 50, 75, and 90 percent of the sample passed each item (Buros, p. 733).

Interrater reliability for the DDST ranged between 90 and 100 percent for each item. The Revised Yale Developmental Schedule was used as a criterion test in the validation of the DDST with eighteen children. A correlation of .97 suggests high validity. However, Werner, in reviewing the DDST in Buros, states that a correlation of .97 with the Revised Yale Developmental Schedule "appears spuriously inflated because the sample is small, skewed in the direction of abnormality, and encompasses a wide age range" (Buros, p. 735).

In later, more extensive validity studies, 236 children were evaluated with the Revised Yale Developmental Schedule, the Cattell Infant Intelligence Scale, and the Bayley Scales of Infant Development. Scores on the DDST were correlated with the scores on the criterion tests. Correlations ranged from .74 to .97. The agreement between the DDST and the criterion tests was also compared useing tests of co-positivity and co-negativity. The results of this analysis showed a marked underselection of the DDST of children who received abnormal on the Denver. For children in the two-year-old range, 43 percent of these children scored abnormal on the Cattell and normal on the DDST. The large number of false positives suggests the Denver may not be a valid test with some populations (Buros, p. 735).

Moriarty, in reviewing the DDST in Buros, questioned the selection of the norming sample from only one geographic area. She also questioned the "applicability of the DDST norms in screening children from lower socioeconomic groups" (Buros, p. 733). She states that the norm groups for the DDST contain a significantly higher proportion of

white children and children whose fathers were in the professional, managerial occupations than the census distribution would warrant (Buros, p. 733).

The Developmental Activities Screening Inventory (DASI)

The DASI is a nonverbal test which measures the cognitive abilities of young children ages six to sixty months. It is administered to children individually. The test includes fifty-five test items that assess such behavioral skills as fine-motor manipulation, cause-effect and means-end relationships, association, number concepts, size discrimination, and seriation. The DASI is easy to administer and can be given by anyone with a basic knowledge of child development. Instructions for the test are given either by demonstration and gesture or by a few simple words. The test can be used with non-hearing children.

A correlation of .91 was obtained when the DASI was administered with the Cattell Infant Intelligence Scale or the Merrill Palmer Scale of Mental Tests to a small sample of 45 children. In another study a correlation coefficient of .95 was found between the DASI and the Denver Developmental Screening Test (Du Bose and Langley, 1977).

Examples of items used in the DASI are: Stacking rings on a cone; Putting pieces into a form board; Stringing beads; and Putting pegs in a peg board.

Learning Accomplishment Profile (LAP)

The Learning Accomplishment Profile is a diagnostic prescriptive tool used to assess children ages six months to seventy-two months.

The LAP can be used to evaluate children entering a preschool program since it provides an objective record of the skills the child has mastered prior to admission to the program. Also it can be used to evaluate a child's progress when he leaves the preschool instructional program. Educators find the LAP useful in validating the impact of their intervention programs. The authors of the LAP manual are careful to caution persons against using the instrument to label children as "slow learners" or "retarded," to identify dysfunctions in children, or to place children in special classes.

The first edition of the LAP was developed under a grant from the Office of Child Development in 1974. This edition attempted to assess normal child development in six developmental areas: social, gross motor, fine motor, self-help, cognition, and language. In developing the first edition, the authors emphasized the development of an instrument which was a non-labeling, non-stagmatizing tool for evaluating the progress of normal child development and for monitoring and evaluating instructional progress. A second grant was obtained in 1975 from the Office of Child Development to finance research on the reliability of individual test items and the accuracy of task sequence. A reliability of .98 was obtained in the second revision (Le May et al., p. 11).

The final revision of the LAP is composed of five discrete scales and thirteen subscales. The determination of the scales to be included in the assessment instrument began with cumulative research findings in the area of childhood development of Gesell (1940), Hammill (1971), Ilg and Ames (1955), Lillie (1975), Sanford (1970), and Griffin (1975).

Test-retest scores on the third revision ranged from .82 to .98 which indicates high reliability of the LAP. The authors did not use national norms; instead locally constructed norms were used. Using the mean and median to calculate the level of performance for specific groups of children, the local norms were more informative and more meaningful to the investigators. They were able to evaluate the level at which individual children were performing in relation to their peers (Le May et al., p. 46).

Maturity Level for School Entrance and Reading Readiness

The Maturity Level for School Entrance and Reading Readiness checklist is a revision of the School Readiness Inventory which was published by Banham (1950). The checklist contains twenty-five behavior items which can easily and rapidly be utilized by a teacher for the child she is observing. The checklist provides an index of reading readiness which the author claims can be used as a rough screening device for beginning classes in reading.

In comparing scores of kindergarten students on the checklist with scores on the Clark First Year Readiness Test, a correlation of .71 and .61 was computed (Banham, p. 2).

The items on the Maturity Level for School Entrance and Reading Readiness Scale were selected from well established developmental scores such as the Gesell Developmental Schedules, Vineland Social Maturity Scale, Oseretsky Tests of Motor Proficiency, Goodenough Drawing Test and others. Examples of items on the checklist are: skips using alternate

feet; stands on one foot for ten seconds; and draws a recognizable man of head, body, arms, and legs without copying.

The McCarthy Scales of Children's Abilities (MSCA)

The MSCA is a diagnostic test appropriate for ages two and one-half to eight and one-half years. The materials and questions are gamelike and nonthreatening. A wide range of behavior is sampled and the child proceeds easily through a number of enjoyable activities. The scales are used for assessing the strengths and weaknesses of children and for pointing out areas where additional in-depth evaluation might prove useful.

The Verbal Scale assesses the child's ability to express himself verbally and also assesses the maturity of his verbal concepts. Subtests comprising the verbal scale are listed below.

Pictorial Memory: Items on this scale require the child to recall the names of objects pictured on a card. This is an easy test of immediate memory for material presented both visually and orally and it is related to the development of vocabulary.

Word Knowledge: Items on this scale require the child to identify common objects and define words. This scale requires the child to demonstrate his understanding of the spoken language of others.

Verbal Memory: Items on this scale require the child to repeat word series and sentences and retell a story read by the examiner. This scale tests the child's ability to repeat words and sentences he hears. This is important developmentally if he is to move ahead in communication skills.

Verbal Fluency: Items on this scale require the child to name as many articles as he can in a given category within twenty seconds. It measures the child's ability to classify and think categorically. Fluency is generally regarded as one aspect of divergent or creative thinking.

Opposite Analogies: Items on this scale require the child to complete sentences by providing opposites. These items enable the child to demonstrate his relational ability.

The Perceptual Performance Scale assesses the child's reasoning ability through the manipulation of materials. It includes the following subtests:

Block Building: Items on this scale require the child to copy four structures built by the examiner out of one-inch cubes. The child's manipulative skills and his perception of spatial relations can be observed.

Puzzle Solving: Items on this scale require the child to assemble a series of six puzzles that form pictures of common animals and foods. Lack of precision, whether due to poor perception, poor motor coordination, or low motivation can be observed.

Tapping Sequence: Items on this scale require the child to copy sequences of notes tapped by the examiner on a xylophone. This test assesses immediate memory for nonverbal material and permits observation of the child's attention and perceptual motor coordination.

Right-Left Orientation: Items on this scale check on the child's knowledge of right and left. This test is administered to children age five and above and assesses the child's orientation in space.

Draw-A-Design: Items on this test require the child to copy geometrical designs. This scale can be used to assess the presence of perceptual or other neurological disabilities. The child's perception of the real world is reflected in his analysis of a design and his ability to treat it as a while figure.

Draw-A-Child: Items on this scale require the child to draw a boy or girl. Human figure drawings can provide information about a child's intelligence as well as his personality.

Conceptual Grouping: Items on this scale require the child to classify blocks on the basis of size, color, and shape. This test assesses the child's ability to deal logically with objects, to classify, and to generalize.

The Quantitative Scale measures the child's facility with numbers and his understanding of quantitative words. It aims to assess the child's number aptitude rather than to explore the upper limit of his computational skills. It is comprised of:

Number Questions: Items on this scale require the child to answer questions involving number information or basic arithmetical computation.

Numerical Memory: Items on this scale require the child to repeat a series of digits in the order presented by the examiner and in reverse order. This is a test of immediate memory and requires some quantitative ability, close attention to the task, and the ability to reproduce material received aurally.

Counting and Sorting: Items on this scale require the child to count and to sort blocks into equal groups which involves the concepts of number and quantity.

The Memory Scale assesses short-term memory in two modalities, visual and auditory, and requires both verbal and nonverbal responses. The subtests involved are also found in other scales:

Pictorial Memory: These items are also found on the verbal scale.

Tapping Sequence: These items are also found on the perceptual-performance scale.

Verbal Memory: These items are also found on the verbal scale.

Numerical Memory: These items are also found on the quantitative scale.

The Motor Scale assesses the child's coordination as he performs a variety of gross and fine motor tasks. Subtests comprising the motor scale are:

Leg Coordination: Items on this test require the child to perform motor tasks which involve the lower extremities, such as walking backwards or standing on one foot.

Arm Coordination: Items on this scale require the child to bounce a rubber ball, catch a bean bag, and throw a bean bag through a hole in a target.

Imitative Action: Items on this scale require the child to copy simple movements such as following one's hands or looking through a tube.

Draw-A-Design: These items are also found on perceptual-performance scale.

Draw-A-Child: This item is also found on perceptual-performance scale (Terrant, pp. 7-8).

The MSCA was standarized on a nationwide stratified sample of 1,032 children, ages two and one-half to eight and one-half years. Reliability coefficients ranged from .72 to .92 on the five scales of the MSCA. For the general cognitive scale the average reliability coefficient for the age groups was .93. In the validity study in thirty-five children, the MSCA was correlated with the WPPSI and the Stanford-Binet Intelligence Scale. The general cognitive index (GSI) correlated .81 with the Stanford-Binet and .62 to .71 with the Wechsler intelligent quotients (McCarthy, p. 40).

In a study by Davis, fifty-three white children ages five years to six years were tested with the MSCA and the Stanford-Binet Intelligence Scale. Davis concluded that scores for general mental ability on the MSCA and the Stanford-Binet were in close agreement. The strength of the MSCA, Davis concluded, is that it yields scores for five separate intellectual functions as opposed to only two on the Binet (Davis, p. 4).

According to Davis the results of his research show that:

> This latter test is a potentially virile replacement for the Binet which has served so well so long, and it appears to fill the gap mentioned by Freides that "at present, no major well established general intelligence tests of the point scale type is available for children between thirty months and forty-eight months." The McCarthy covers this age group. (Davis, p. 5)

Practical experience with a limited sample leads to a preliminary and tentative judgment that the MSCA has good psychometric characteristics and will meet with the approval of experienced workers in the field of testing (Davis, p. 5).

Kaufman and Dicuio (1975) performed a factor analysis of the MSCA on separate groups of black and white children to evaluate the

instructive validity of the MSCA for each racial group. Results of the study confirm the construct validity for each racial group which enhanced the use of the MSCA for assessing children of different racial groups (Kaufman and Dicuio, p. 10).

Other research has shown that the MSCA scales are sensitive to children having learning disabilities in the way that the traditional intelligence quotients are not. General cognitive index scores seemed to average about twenty points lower than intelligence quotients for children who had learning disabilities. A low general cognitive index (GCI) on the MSCA does not indicate mental retardation; rather, it could indicate that there is little likelihood of the child succeeding in school. "A low GCI accompanied by a Binet or Wechsler intelligence quotient of about twenty points higher suggests a learning disability" (Kaufman and Kaufman, p. 72). If the GCI and the intelligence quotient are approximately the same, it implies retardation (Kaufman and Kaufman).

Portage Project Checklist

The Portage Project Checklist is a lengthly listing of behaviors which is color coded and can be used with either handicapped or normal children. The five hundred and eighty developmentally sequenced behaviors are divided into six areas: infant stimulation, socialization, language, self-help skills, and cognitive and motor development. The purpose of the checklist is to check behaviors that the child is presently exhibiting and to note the behaviors not yet learned. Specific suggestions for helping the child learn the developmental behaviors not quite mastered are contained in a card file containing

curriculum ideas. The checklist and the card file are used by educators, paraprofessionals, and parents as a means of behavioral evaluation and assessment and as a curriculum guide (Shearer et al., pp. 2-6).

The checklist was developed by identifying behaviors from a variety of preschool developmental scales and tests. These included the Alpern-Boll Developmental Skills Age Inventory (1969), the Cattell Infant Intelligence Scale (1940), the Peabody Picture Vocabulary Test (1965), the Vineland Social Maturity Scale (1936), the Sheridan Scale (1960), the Gesell (1940), the Slossen Intelligence Test for Children and Adults (1940), the P.A.C. (1956), the Preschool Attainment Record (1966), and the Stanford-Binet Intelligence Scale (1960). These standardized scales and tests were combined into an easily administered and scored sequence of behaviors. A newer revision of the checklist was published in 1976 and has been used in planning intervention programs for handicapped children (Shearer et al., p. 3).

Preschool Attainment Record (PAR)

The Preschool Attainment Record is a revision of the Vineland Social Maturity Scale which was developed by Doll (1965). The PAR assesses children from birth to seven years in eight separate areas of developmental functioning: ambulation, manipulation, rapport, communication, responsibility, information, ideation, and creativity. The aim of the PAR is to provide an assessment of normal preschool children and those with various types of handicaps including social-cultural. It enables the examiner to examine indirectly rather than

directly (Doll, 1966). The PAR is particularly useful for children who have speech or language difficulties, emotional disturbance, or other impairments which might hinder testing.

The PAR provides a record of performance which can be used as baseline data for educational planning and treatment. It can be used in a preschool curriculum or in a home training program. The PAR was not normed; rather, the author preferred to use the inventory as a "developmental inventory which is speculatively developmental but not statistically verified" (Doll, p. 23).

Examples of four-year-old items in each of the eight areas of the PAR are: copies square, plays cooperatively, relates in paragraphs, tells name, dresses self, knows the defination of day and night, counts to four, and draws spontaneously.

The Psychoeducational Screening Test (PET)

The PET was constructed to provide a profile of the developmental status of four-year-old children prior to kindergarten entry. With the aid of this profile, parents can gain a better understanding of their child's development in some important areas of functioning. The PET is directed toward the identification of developmental strengths as well as weaknesses. While it is not a diagnostic test in itself, it can alert parents and professionals to possible developmental advances of delays.

Numerous developmental and preschool tests were surveyed to select potential test items with several factors being considered. First, items which were relatively easy to administer, score, and interpret were selected. Second, items were selected which appeared to have a

high interest value to four-year-old children. Third, items were selected which had previously been found to be reliable and valid indices of the functioning of four-year-old children. Fourth, normative data was also available for all the items. No item was selected for the PET which was not passed by at least 85 percent of the four-year-olds to which it was administered. Fifth, items selected were considered relevant to one of the seven developmental functions being examined by the PET (North Carolina Department of Human Resources).

On the basis of the above rationale, items were selected and combined into a test which focused on the following developmental functions: gross motor development, auditory memory, visual memory, auditory perception, visual motor performance, language development, and concept development.

In addition, a set of supplemental items was added to the PET. These five-year-old items were designed to identify four-year-olds who were demonstrating developmental advances in the various functions being assessed by the PET.

The PET consists of eighteen separate items which are automatically administered to each child and nine supplementary items whose administration is dependent upon the child's performance on the first eighteen items. The seven scales and the items which compose them are described below:

Gross Motor: The items on this scale check on the child's coordination and balance. Specifically, they require him to balance on one foot and to hop on one foot.

Visual Memory: The items on this scale check on the child's ability to remember what he has seen. They require him to reconstruct a series of colors in the correct order and to identify objects which are removed from a group of objects.

Auditory Memory: These items check on the child's ability to remember what he hears. Specifically, they require him to repeat a series of three digits, to carry out three commands, and to repeat several sentences.

Visual Motor Performance: These items check on the child's ability in coordinating what he does with his hands with what he sees. Specifically, they require the child to copy a cross, to draw a man, and to grip a pencil adequately.

Auditory Perception: These items check on the child's ability to identify common sounds. Specifically, they require the child to identify the sound of hands clapping and a bell ringing.

Concept Development: These items check on the child's ability to notice similarities and differences between different objects. Specifically, they require him to identify and explain which of several visual forms looks most like a wheel, to demonstrate his understanding of relationships of length, to identify objects of similar sizes, and to identify pictures that look alike.

Language Development: The items in this area check on the child's ability to provide basic identifying information about himself, about familiar objects, and familiar properties of objects (Terrant, pp. 4-5).

The pilot study for the PET was conducted on over 300 children ranging in ages from three to six years. To determine reliability, each

item on the test was assessed for both stability (test-retest reliability) and the percentage of agreement among independent raters. The reliability coefficients for test-retest reliability ranged from .58 to 1.00. Items which obtained a test-retest stability coefficient of below .80 were discarded. Inter-rater stability coefficients ranged from .42 to 1.00. Items which had an inter-rater agreement of below 85 percent were to be discarded; however, an examination of the data and the items on the PET indicates that several items were left in the test which fell below the .80 and .85 cut off scores (Zinn, pp. 20-22).

In the pilot study the concurrent validity of the PET was determined by administering the PET and the Peabody Picture Vocabulary Test (PPVT) and the Test of Basic Experiences (TOBE). The only correlations that could be made were on the language function, as the PPVT and TOBE did not test the other functions. Of the twenty-five children participating in the study, twenty-one were identified correctly. Four children were incorrectly identified—two as false positives and two as false negatives (Zinn, p. 25).

In the normative study a sample of 322 children ages three through six were tested with the PET. The percentage of children in each age group who passed each item was calculated. Nine items were not passed by 75 percent of the children in the study. The PET in its present form contains four of these items in the four-year-old section of the test (Zinn, p. 31).

Stanford-Binet Intelligence Scale

Binet and Simon developed the first intelligence test in 1905, for the purpose of determining which students in Parisian schools would benefit from regular classes as opposed to special classes for retarded children. A second revision of the test was published in 1937 by Terman and Merrill. This revision followed after years of experimenting with intelligence tests and was the result of ten years of research and standarization (Yussen, p. 295).

The third revision of the Binet, published in 1960 by Terman and Merrill, incorporated the best items from the second revision. The third revision checked on the ability levels of young people ages two through adulthood. The scale tested the same types of mental activities that Binet had found to be useful in distinguishing differences in intelligence: analogies, opposites, comprehension, vocabulary, similarities and differences, verbal and pictorial completions, absurdities, drawing designs, memory for meaningful material, and memory for digits. These activities contributed to a total score, or a measurement of general intelligence (Terman and Merrill, p. 8).

The second revision of the Binet was standarized on 3,184 subjects who received both forms (L and M) of the test. The items selected for the third revision were chosen based on the performance of 4,498 subjects who had taken the second revision between 1950 and 1954. No new items were added to the third revision, although some of the test materials were updated (Anastasi, pp. 190-192). Reliability information on the third edition was based on the second edition of the Binet. The

scores on both forms (L and M) of the second standardization sample were correlated to produce reliability coefficients that ranged from .83 to .98. In general, the Binet tends to be more reliable for older children than younger children (Merrill and Terman).

The validity of the Binet was determined by correlating scores with school grades and achievement tests. These positive correlations of .40 and .75 reflect the fact that the Binet, particularly at the upper age levels, is highly loaded with verbal material (Anastasi, p. 203).

The 1972 revision of the Binet differs from previous editions in that it included more children from minority groups than were included in earlier standarization samples. The 1937 standardization sample, for instance, contained only white children. The 1972 revision contained both verbal and nonverbal items and it contained measures of attention, comprehension, and memory. These components are now scored separately as they are on other developmental or intelligence tests (i.e., The McCarthy Scales of Children's Abilities). Instead the child is given an overall score that indicates his intelligence quotient or general level of intellectual functioning.

There are several other intelligence tests, which are considered valid and reliable, that are used to test the intelligence of young children. However, there are not any general intelligence tests available that will test children between thirty months of age, which is the ceiling for the often used Bayley Scales of Infant Development, and forty-eight months, which is the basal for the Wechsler Preschool and Primary Scale of Intelligence. Because the Binet fills this gap for

children thirty to forty-eight months and because the instrument is considered by many to be well standardized and highly reliable, the Binet remains a popular instrument to use with young children (Buros, p. 773).

VI. SUMMARY

The information presented in this chapter has described some of the approaches which have been taken in the screening of young children for the detection of developmental disabilities. In the past the task of identifying children with developmental problems was left to parents. Ingram, Sheridan, Scurletis and Hendrick, seeing the value of early identification of children with handicaps, called for the comprehensive screening of young children by physicians, nurses, and other health officials. Models for comprehensive screening of young children were developed in many states. Most of these screening programs were medically oriented with an emphasis on physical factors. Gradually the necessity for cognitive screening came into being. Various developmental tests for speech, vocabulary, and visual perception as well as psychological tests were used in addition to the medical tests to gain additional information about child development. The last section of this chapter is devoted to a description of the developmental and preschool tests containing items used in the screening test developed by this investigator. The items used in the screening test were selected from twelve of the sixty-nine tests reviewed by this investigator.

CHAPTER III

PROCEDURES

I. INTRODUCTION

The purpose of this study was to develop a reliable and valid screening instrument which, when compared with the North Carolina Psychoeducational Test, would be a more sensitive instrument and would reduce the number of four-year-old children requiring further diagnostic testing. The procedures used in conducting this study were as follows: (1) selection of initial test items, (2) development of test format, (3) administration of test items, (4) scoring of test items, (5) pilot work, (6) test revision, (7) selection of sample population, and (8) statistical tests.

II. SELECTION OF INITIAL TEST ITEMS

Several developmental and preschool tests were surveyed to select potential test items in developing the PET. Items selected for inclusion in the PET were derived from the following instruments: the Santa Clara Developmental Inventory (1974), Educational Testing Service's CIRCUS (1975), the Caldwell Preschool Inventory (1971), the Stanford-Binet Intelligence Scale (1972), and the Denver Developmental Screening Test (1976). The following criteria were used in deciding which items should be included in the PET.

1. Face Validity. The items to be included in the test looked as if they could be useful in demonstrating a

child's performance in one of the seven developmental areas being examined.

2. Prior Standarization. The items chosen previously had been found to be reliable and valid indices of four-year-old functioning.
3. Normative Data. Items were selected which, in previous studies, had been passed by at least 85 percent of the four-year-olds to whom they had been administered.
4. Interest. Items were selected which appeared to have a high interest value to four-year-old children.
5. Ease of Administration. Items selected were relatively uncomplicated to administer, score, and interpret, and could be administered in a short time period. (Zinn, pp. 9-10)

In selecting items for the screening test a comprehensive survey of sixty-nine developmental and preschool tests was conducted. The items to be included on the test would represent five age groups: two and one-half to three years, three to three and one-half years, three and one-half to four years, four to four and one-half years, and four and one-half to five years. A review of these tests can be found in Chapter II. The criteria used for selecting the initial test items were the same as those used in developing the PET.

III. DEVELOPMENT OF TEST FORMAT

Sixty items were chosen to be included on the screening test. These items were selected from twelve preschool developmental and screening tests and were thought to be the best items for determining developmental functioning for the five individual age groups. (See Appendix A for a list of the items and the tests from which the items were selected.) The items were then divided into six functional areas: visual memory, auditory memory, gross motor development, visual motor performance, language development, and concept development. In each of

these areas there were ten questions, two for each of the five age groups. The items were grouped by age for the purpose of easy test administration. The two-year-old items were arranged first in each area, followed by the three- and four-year-old items. (See Appendix B for the Pilot Test Record Form.)

IV. ADMINISTRATION OF TEST ITEMS

The screening instrument developed by this investigator was designed to be administered in a standardized manner. To assure that the examiners followed the same basic guidelines in administering the test items on the screening instrument and on the PET, the procedures outlined in the PET manual under "General Testing Guidelines" were used. (See Appendix C.) Both tests were designed to require between twenty and thirty minutes to administer.

V. SCORING THE TEST ITEMS

The examiners were directed to administer the test items in the order presented on the test record form, beginning with the section on visual memory and ending with concept development. The items that were in the same age group as the age of the child being tested were presented first. If the child failed the items in his age group for any of the six developmental areas, it was an indication that the child could have a weakness in that area. The examiners were then directed to give the items in the next lowest age group until the child got at least three items correct in a lower age group. If the child passed all

the items in his age group, the examiner would then give the items in the next highest age group until the child missed three consecutive items. For example, if the examiner were testing a child three years and three months old, he would administer all the items appropriate for three-year-olds in the visual memory category. (See Appendix B, visual memory category, items three through six.) If the child failed to get at least three items correct, the examiner would then administer the two-year-old items. (See Appendix B, visual memory category, items one and two.) If, on the other hand, the child passed three or more of the three-year-old items then the examiner would administer the items in the four-year-old range until the child missed three consecutive items. (See Appendix A, visual memory category, items seven through ten.) The basal level was the level at which the child failed three or more items in an age group. The ceiling was the level at which the child passed three or more items.

A child was scored pass or fail for each of the six areas of the test based on the number of items missed for his age group. If a child missed two out of four items appropriate for his age group in any of the six functional areas, he failed that area.

In scoring four-year-old children for the comparative study, the children were expected to pass all the four-year-old items in the six areas of the test. If a four-year-old missed two out of four, three out of four, or four out of four of the four year items in any of the six functional areas he was considered questionable. The decision to refer the child for further testing was then based on the child's performance

on the three-year-old items. If the child got three out of four or four out of four of the three-year-old items correct, he would not be referred for further testing. If, however, the child failed two or more items in the three year group, he was given the two year items and referred for further testing with the MSCA.

VI. PILOT WORK

Forty-six children were tested in the pilot study. These children ranged in ages from two and one-half years to five and one-half years. An attempt was made to include children representative of both sexes, black and white children, and children from a wide range of socioeconomic groups.

As previously stated, only children of average or above intelligence could be included in the study. Twenty children were excluded from the pilot study after testing began because they appeared to be delayed in several areas, or because they exhibited behaviors that indicated they were functioning below average ability. The twenty-six children who remained in the pilot study appeared to be of average or above intelligence.

VII. TEST REVISION

The percentage of children passing each item in six age groups was determined. Items which were not passed by 75 percent of the children in the pilot study were examined very closely. These items were again researched to determine their validity and reliability in previous norming studies.

After reviewing information on the age appropriateness of each of the items in the pilot study, the investigator found some items which were either too difficult or too easy. Several items were placed in a younger age group based on the percentage of children passing the item and the children's responses to the tasks. For example, item twenty-three (Jumps in Place) was passed by 66.7 percent of the children, but three children refused to perform the task and, therefore, failed the item. This dropped the percentage of children passing the item to 66.7 percent. These children knew the task was too easy for their age level and could not be persuaded to jump in place. In observing their performance on the more difficult gross motor items, it was apparent that these children could have performed item twenty-three if they had tried. Other items were placed in an older age group because they were too difficult for the children. Item twenty-two (Hops on One Foot) was passed by 0.0 percent of the children in the two year age group and was therefore moved to a higher age group.

Six items were replaced with new items. These items were passed by 100 percent of the children, except for item twenty-eight (Jumps Two Inches) which was passed by 75 percent of the four-year-olds that were administered this item by the examiners. In administering these items, it was clear that the children performed the tasks rapidly without any hesitation. Some four-year-olds refused to complete item twenty-eight commenting that the item was too easy.

The final revision of the instrument included sixty items—ten in each of the developmental areas. Because the test was designed for

four-year-old children, the format of the test was reversed so that the four-year-old items were administered first, followed by three-year-old items, and finally two year items. The method of administration and scoring, previously described, remained the same. (See Appendixes D and E for the Screening Test and the Screening Test Answer Sheet.)

VIII. SELECTION OF THE SAMPLE POPULATION

The sample population on which the new test items were standardized had the following characteristics:

1. The sample was taken from northwestern North Carolina.
2. Children in the sample were divided into six age groups: two and one-half to three years, three to three and one-half years, three and one-half to four years, four to four and one-half years, four and one-half to five years, and five years to one-half years.
3. All children with a high risk of developmental abnormalities were excluded from the study along with children with gross physical defects.
4. A wide range of socioeconomic levels was included so that the items would represent the abilities of children from many socioeconomic levels.
5. The sample was not randomly selected.

This investigator contacted day care centers, child development centers, nursery schools, kindergartens, and other community agencies for the purpose of obtaining recommendations for children to be included

in the norming sample. An effort was made to include children in the sample that were representative of the population in Northwest North Carolina, with regard to socioeconomic status, sex, and race.

One hundred and eleven children representative of the population in Northwestern North Carolina were selected to participate in the norming sample. Several children, because of emotional immaturity or inconstancy, were threatened by the testing situation. These test results were eliminated from the norming sample along with incomplete test profiles. At the end of six months of testing, eighty-six subjects remained who met the criteria established for subjects who would participate in the norming study.

An explanation of the testing procedures, use of test results, and the scheduling of testing sessions was made to the parents of children selected to participate in the study. The consent form (see Appendix F) was explained in detail and given to the parents for their signatures.

IX. STATISTICAL TESTS

Computation of the Norms

In each age group the percentage of children who passed each item was calculated. The data were organized into frequency distribution tables showing six age groups (two and one-half to three years, three to three and one-half years, three and one-half to four years, four to four and one-half years, four and one-half to five years, and five to five and one-half years) and the sixty test items. The level of item difficulty was determined by computing the relationship between each

item and the total score using a point biserial. Consideration was then given to the percentage of children who passed each item according to race (black/white), sex, and the five occupational levels used in the standardization of the MSCA:

1. Professional and technical workers;
2. Managers, officials, proprietors, clerical workers, and sale workers;
3. Craftsmen and foremen (skilled workers);
4. Operatives, service workers (including private household), farmers and farm managers (semi-skilled workers); and
5. Laborers, farm laborers, and farm foremen (unskilled workers).

In order to determine if the population of the testing sample was proportional to the population in the northwest region of North Carolina in regard to race, sex, and occupational groups, a chi-square analysis was performed.

Reliability Among Raters

Following the pilot study, this investigator (acting as an examiner) and two other examiners initiated the testing of children with the screening instrument. In the early stage of testing, ten children of varying ages were selected to be tested by two examiners for the purpose of determining the reliability among examiners. In order to eliminate the effect of a child learning during the first administration and, thus, producing a biased situation for the second examiner, the examiners testing the children alternated—one testing first one child, the other testing first the next child. Determination of the

reliability of scoring by the examiners was made using a Fisher Exact Test and two measures of association based on the chi-square, the phi coefficient, and the contingency coefficient.

Instrument Reliability

The reliability of the screening instrument was computed using the Kuder-Richardson and the split-halves method.

Instrument Validity

Thirty-one children were selected to be tested by both the MSCA and the screening instrument. A chi-square, a phi coefficient, and the contingency coefficient were used to determine the correlation between each of the six functional areas of the screening instrument and each of the five functional areas of the MSCA. The correlation between the total scores of the screening instrument and the MSCA was computed using the same statistics.

Comparative Study

This portion of the study involved the comparison of scores on the screening instrument with scores on the PET. The purpose of this comparison was to determine the extent the screening instrument and the PET correlated with the MSCA. Scores from the screening instrument and the PET were compared to determine which test made a more accurate decision in referring children for further diagnostic testing. A sample of sixteen children were administered the screening instrument, the PET, and the MSCA. The children were rated pass or fail on the six areas of the screening instrument and the seven areas of the PET.

Cut off scores (1 standard deviation below the mean) were determined for each of the five areas of the MSCA. A phi coefficient and a contingency coefficient were calculated to determine the correlation between the six areas of the screening instrument, the seven areas of the PET, and the five areas of the MSCA. A Fisher exact test was performed to determine the extent the total score on the screening instrument and the PET correlated with the total score on the MSCA. The sixteen test administrations were also examined individually to determine if the screening instrument was a more sensitive instrument than the PET.

CHAPTER IV

FINDINGS OF THE STUDY

I. INTRODUCTION

The purpose of this study was to develop a reliable and valid screening instrument which, when compared with the North Carolina Psychoeducational Test, would be a more sensitive instrument and would reduce the number of four-year-old children requiring further diagnostic testing. In order to successfully develop the screening instrument, it was necessary to select the test items which would measure the developmental functioning of children ages two to five years. Following the selection of the test items, a pilot study was conducted to determine if the items were appropriate for the ages being considered. These data were used in determining which items would be included on the screening instrument.

The screening instrument was then administered to eighty-six children by three examiners for norming purposes. The percentage of children passing each item within the six age groups (group I, two and one-half to three years; group II, three years to three and one-half years; group III, three and one-half years to four years; group IV, four years to four and one-half years; group V, four and one-half years to five years; and group VI, five years to five and one-half years) was determined. A point biserial was also computed for each item to determine the discriminating power of the items.

The percentage of children within the six age groups, passing each item, was calculated according to race, sex, and occupational level of father and mother. The norming sample of eighty-six children was compared with the general population in counties from which the sample was drawn, according to sex, race, and occupational level of parents.

Since three different examiners tested the children, it was necessary to determine the inter-rater reliability. In order to determine if the screening instrument was reliable, Kuder-Richardson$_{20}$ and split-halves reliability tests were computed. The validation of the screening instrument required that it be correlated to a valid and reliable criterion instrument. In this study the McCarthy Scales of Children's Abilities (MSCA) was used.

Finally, the screening instrument and the PET were administered to sixteen four-year-old children who were also tested on the MSCA. A Fisher exact test was used to compute the significance level of the correlation of the functional areas of the screening instrument and the PET with the MSCA. The result of the pilot study, the norming study, and the reliability, validity, and comparative analyses are presented in this chapter.

II. PILOT WORK

The responses of twenty-six children on the sixty items of the pilot test were examined to determine which items were appropriate to include in the screening instrument. The percentage of children passing each item according to age groups was calculated. (See Appendix G, Table I.)

Using the percentage of children passing as the criterion for selecting the items, the investigator found some items either too difficult or too easy for the age group for which they were designed. Item three (Copies M or N), item eighteen (Repeats Story), item forty-six (Talks About Pictures), item six (Six Piece Puzzle), and item twenty-two (Hops on One Foot) were moved to a lower age group because they were too difficult for the children in the age group for which they were originally designed. Item twenty-four (Broad Jump), item thirty-eight (Draws a Man), and item twenty-three (Jumps in Place) were moved to a higher age group because they were too easy for the age group for which they were originally designed. Several children acted as though these items were too easy for their age level and could not be persuaded to perform the task.

Six items were replaced with new items. These items were passed by 100 percent of the children, except for item twenty-eight (Jumps Two Inches) which was passed by 75 percent of the four-year-olds that were administered this item. In administering these items, it was clear that the children performed the tasks rapidly without any hesitation and some children commented that the items were too easy. The items which were replaced are listed below along with the new items:

Item Number	Pilot Item	New Item
9	Names Objects from Memory	Pictorial Memory
26	Finger Touch	Walks Backwards
28	Jumps at Least Two Inches	Running Broad Jump
34	Dumps Raisin from Bottle	Form Board
41	Names Common Pictures	Picture Vocabulary
51	Identifies Objects	Identifies Objects by Use

Ten items, which were not passed by 75 percent of the children in the age group for which they were originally designed, were kept in the same position on the screening test. In one case the number of children in the age group was too small to warrant moving the item or eliminating the item. The items which were kept in the same position are listed below:

Item Number	Item	Percentage Passing	Age Group
4	Folds Paper	67	II
5	Adds Parts to Man	25	III
13	Repeats Simple Sentence	67	II
14	Repeats Three Digits	67	II
30	Skips Using Alternate Feet	0	V
37	Imitates Square	50	IV
44	Comprehends Cold, Tird, and Hungry	67	II
52	Train of Cubes	0	I
53	Matches Three Primary Colors	67	II
54	Comparison of Balls	67	II

On the ten items which were kept in the same position, seven were passed by the majority of children in the age group for which they were designed. Item fifty-two was not changed because there was only one child in the pilot sample representing group I. The remaining three items (four, thirty, and thirty-seven) were kept in the same position since there was not a more appropriate place in the screening test to put them. The final screening test contained sixty items with ten questions in each of the six functional areas.

III. COMPUTATION OF NORMS

In each age group the percentage of children passing each item, according to age group, was calculated. These data were organized into frequency distribution tables showing the six age groups and the sixty test items along with a point biserial which was computed to show the discriminating power of each item. (See Appendix H, Table II through Table IV.)

In computing the norms, it was anticipated that 75 percent of the children would answer each item correctly which was appropriate for the age groups in which the children were assigned. For example, the children in group I (two and one-half to three years) should answer 75 percent of the two-year-old items correctly. Any of the two-year-old items on the test which were answered by less than 75 percent of the children in group I would need to be examined more closely. The percentage of children in each age group passing the items assigned for that age group is presented in Appendix I, Table V through Table IX.

Nine items were not passed by 75 percent of the children in the age group for which the items were originally designed. These items are listed below along with the percentage of children passing the items:

Item Number	Item	Percentage Passing	Age Group
27	Hops on One Foot	57	I
7	Copies M or N	36	II
47	Comprehends Cold, Tired, and Hungry	64	II
55	Recognizes Colors	67	III
14	Repeats Sentence	60	IV
33	Imitates Square	40	IV
3	Recognizes Letters	73	V
12	Repeats Story	74	V
21	Skips	32	V

In most norming studies, cut off scores for percentages of children passing the items range from 50 to 85 percent. In selecting the items for the screening test it was expected that 75 percent of the children would pass each of the items; however, if 50 percent of the children passed the items, it was considered to be an acceptable item and worth researching with a larger group of children. Items seven, twenty-one, and thirty-three were passed by less than 50 percent of the children in their given age group and should be revised or replaced with new items.

Point biserials were computed to determine the discriminating power of the items on the screening test. If fifty-one out of the sixty items on the screening instrument the point biserial was positive, indicating that the children who scored well on these items also scored well on the test as a whole. Nine of the items had negative point biserials, indicating that the children who did well on the overall test did not do well on these items.

The percentage of children within each age group passing the items was calculated according to race, sex, and occupational level of father and mother. There was no significant difference in the percentage of blacks and whites passing the items, except for item twenty-two (Heel Toe Walk). In age group V, 93.3 percent of the white children passed the item while none of the black children passed it. (See Appendix J, Table X through Table XII.) There were no significant differences in the percentages of males and females passing the items, except in age group III, item forty-one (Opposite Analogies), where 55.6 percent of

the females passed the item while none of the males passed it. (See Appendix K, Table XIII through Table XV.)

When the percentage of items passed by children, grouped according to father's occupation, was analyzed the following results were found:

1. In groups I, II, and V there was no significant difference in the way the children answered the items.

2. In age group III there was no significant difference in the way the children answered the items, except for item fifty-seven (Comparison of Balls) which was passed 100 percent of the time by occupational groups three and four, 66.7 percent of the time by occupational group one, and was not passed by children in occupational groups two and six.

3. In age group IV there was no significant difference in the way the children answered the items, except for item number seventeen (Repeat Three Digits), item forty-five (Repeats Twelve Syllable Sentence), and item fifty-four (Comprehension, Thirsty/Stoves) which was passed by 100 percent of the time by occupational groups one, two, three, and four. Occupational group five dod not pass these items.

4. In age group VI there was no significant difference in the way the children answered the items, except for items fifty-two (Comprehension Eyes/Ears) and fifty-five (Recognizes Colors). Both items were passed by 100 percent of the children in occupational groups one, two, and five. Occupational group four did not pass the item. There were no children in occupational group three.

These results indicate that most of the items were not biased toward children whose fathers were from different occupational categories (Appendix L, Table XVI through Table XXI).

When the percentage of items passed by children grouped according to mother's occupation was analyzed the following results were found:

1. In age groups II and V there was no significant difference in the way the children answered the items.

2. In age group I there was no significant difference except for item fourteen (Repeats Sentence). Item fourteen was passed by 100 percent of the children in occupational group five but was not passed by any of the children in occupational groups one, two, and four.

3. In age group III there was no significant difference in the way the children answered the items, except for item fifteen (Identifies Noise) and item twenty-one (Skips Using Alternate Feet). Item fifteen was passed by 100 percent of the children in occupational groups one, two, and five and 85.7 percent of the children in occupational group four. None of the children in occupational group three passed the item. Item twenty-one was passed by all the children in occupational group three and 14.3 percent of the children in occupational group four. None of the children on occupational groups one, two, and five passed the item.

4. In age group IV there was no significant difference except for item twenty-four (Balance on One Foot). Item twenty-four was passed by all of the children in occupational groups three, four, and five and none of the children in occupational groups one and two.

5. In age group VI there was no significant difference except for items fifty-two (Comprehension Eyes/Ears) and item fifty-five (Recognizes Colors). Items fifty-two and fifty-five were passed by all

the children in occupational groups one, two, and five and by none of the children in occupational group four. There were no children in occupational group three.

These results indicate that most of the items were not biased toward children whose mothers were from different occupational catagories. (See Appendix M, Table XXII through Table XXVII.)

The children participating in the study came from the northwest region of North Carolina. They were not randomly selected, therefore consideration was given to whether the sample deviated from the population in that region according to sex, race, and occupation level of the father and mother. In the sample there were forty-one males and forty-five females. The expected frequencies based on the 1970 census statistics for a sample of eight-six was forty-four males and forty-two females. The sample population was not significantly different from the general population in regard to sex.

There were seventy-four whites and eleven blacks in the sample. The expected frequencies for a sample size of eighty-six was eighty-one whites and five blacks. The sample was significantly different from the population in regard to race at the .05 level. However, in reviewing the 1970 census statistics the figures for black children under the age of six in two of the counties in the sample appear to be extremely low when compared with present estimates of black children living in these counties. The possibility exists that the 1970 census statistics are not correct and that the sample population may not be significantly different from the general population.

The number and expected frequency of children in the sample grouped according to father's occupation are found below:

Occupation Group	Actual Number	Expected
1	17	9
2	11	19
3	12	14
4	38	41
5	8	3

There was a significant difference in the size of the norming sample and the expected size of the sample based on census figures in occupational groups one, two, and five. In these three groups there was a greater percentage of children in the sample than in the general population.

The number and the expected frequency of children in the sample grouped according to mother's occupation are found below:

Occupation Group	Actual Number	Expected
1	12	9
2	18	22
3	7	3
4	38	47
5	11	5

There was a significant difference in the size of the norming sample and the expected size of the sample based on census figures in occupational groups three and four. In both cases there was a greater percentage of children in these categories than in the population.

IV. RELIABILITY AMONG RATERS

The eleven children selected to participate in this part of the study were tested twice—once by this investigator acting as an

examiner and once by one of the other two examiners. Determination was made as to the reliability among the examiners by using a Fisher exact test. A Fisher value was obtained for each of the sixty items and in no incidence was it significant at the .01 level of confidence. This indicates that there was no relationship between the examiners and their ratings and that the ratings of the examiners were consistent.

Two measures of association based on the chi-square, the phi and contingency coefficients, were also computed which supported the finding that there was a low correlation between the examiners and their ratings. The results of the phi and contingency coefficient computations are given in Appendix N, Table XXVII and Table XXIX.

V. INSTRUMENT RELIABILITY

Using the Kuder-Richardson$_{20}$ a reliability of .938 was computed. The split-halves statistical method computed a R of .8731. Using the Spearman-Brown formula:

$$r_{xx} = \frac{2R}{1-R}$$

a reliability coefficient of .932 was computed for the screening test. The Kuder-Richardson$_{20}$ and the split-halves calculations indicate that the screening test gives consistent results.

VI. INSTRUMENT VALIDITY

A chi-square value of 6.09524 was computed when the total score of the screening test was compared with the total score of the MSCA. This

was significant at the .0136 level. (In this study any level of significance beyond .05 will be indicated.) The phi coefficient was computed as .509 and the contingency coefficient was .453, indicating that the screening test correlated moderately high with the MSCA. In addition to the analysis of total scores, each functional area of the screening test was compared with the five areas of the MSCA. (See Appendix O, Table XXX.) Five of the seven functional areas of the screening test showed significant correlations with the five functional areas of the MSCA at the .01 level. The areas of the screening test which correlated with the MSCA are listed below:

Screening Test	MSCA
Visual Memory	Perceptual Performance
Visual Memory	Memory
Auditory Memory	Memory
Gross Motor	Motor
Visual Motor Integration	Perceptual Performance
Language Development	Verbal
Language Development	Quantitative

In all seven incidences the phi coefficient was .60 or higher. The contingency coefficients were .47 or higher. In addition to these correlations, the screening test verbal area correlated with the MSCA memory area at the .05 level of significance. These correlations indicate a moderately high relationship between the eight areas of the screening test and the five areas of the MSCA.

VII. COMPARATIVE STUDY

Sixteen children were administered the screening test, the PET, and the MSCA for comparative purposes. Appendix O, Table XXXI, shows the

statistical results of this comparison. In three incidences the functional areas of the screening test correlated more closely with the MSCA than the PET at the .01 level of significance. These were:

Screening Test	MSCA
Visual Motor Integration	Perceptual Performance
Visual Memory	Perceptual Performance
Gross Motor	Motor

When the screening instrument was compared with the MSCA in terms of the number of children passing and failing, a phi coefficient of .765 was computed indicating a moderately high correlation between the screening test and the MSCA. The phi was converted to a chi-square value of 12.24 which was significant at the .001 level. When the PET was compared with the MSCA in terms of the number of children passing and failing, a phi coefficient of .439 was computed. This was converted to a chi-square value of 7.02 which was significant at the .01 level. Both tests correlated significantly with the MSCA.

Although the statistical results indicate that both the screening test and the PET correlate significantly with the MSCA, a case study was performed on each subject to determine which test allowed the examiner to make a decision regarding referral with a greater degree of confidence. The basis for deciding whether a child passed or failed the three instruments used in the comparative study was made according to the following criteria:

Psychoeducational test. When the PET was in its pilot stage one failure in any of the functional areas of the test was the criteria used

to refer the child for further testing with the MSCA. Later the decision was made to use two failures as the criterion for referral. In this study the criterion of two failures was used in deciding whether or not to refer for further testing.

MSCA. Scaled scores in each of the five functional areas of the MSCA were used to indicate good or poor performance. If a child received a score of forty (one standard deviation below the mean) or below in any of the five areas of the MSCA, he was considered to have failed that area.

Screening test. The criterion for referring a child was not based on the number of areas passed or failed. Rather, if a child failed any area of the test (e.g., he passed two out of four or less of the items in his age range), his score was considered questionable. An examination of the child's score on the next lowest group of items was used in determining whether or not the child would be referred for further testing. If the child failed to get four out of four or three out of four of the items correct in the lower age group, he would be referred for further testing.

A description of the sixteen subjects who participated in the comparative study and their performance on the three instruments used in the study follows:

C. M. 00. This subject was female, age four years and four months. She passed all areas of the screening test. On the PET she passed all areas except concept development. On the MSCA she scored well in all areas. Her general cognitive index was 104 which was equivalent to a mental age of approximately four years and seven months.

Summary: C. M. passed all areas on the screening test and was not, therefore, referred for further testing. She failed one area of the PET but was not referred for further testing based on the criterion of two failures as a cut off score. Her MSCA scores show that she performed well. The decisions not to refer for further testing were correct.

B. B. 01. This subject was a male, four years and eight months of age. He passed all six areas of the revised instrument and all seven areas on the PET. His score on the screening test was very high; he only missed two out of sixty items. His score on the PET was satisfactory in all seven areas; however, he missed failing concept development by one point. The criteria for concept development on the PET are much more stringent than for the other six areas. His scores on the MSCA were extremely high. His general cognitive index was 182+, the highest a child can score in the four year and eight month age group.

Summary: B. B. passed all items on the screening and on the PET. He was not referred for further testing for either instrument. His MSCA scores showed extremely high functioning in all areas of the test. The decision not to refer for further testing was correct for both the screening instrument and the PET.

K. P. 02. This subject was a male, age four years and six months. He passed two areas of the screening instrument: gross motor and language development. He failed visual memory, auditory memory, visual motor integration, and concept development. In addition to failing most of the four year items in these four areas, he failed most of the three items in the visual memory and visual motor integration areas. When

given the PET he passed all areas of the test; however, his scores were low. In three areas (concept development, visual memory, and auditory perception) he passed by only one point. When given the MSCA, his scores came below the mean in two areas. His lowest scores were memory and perceptual performance (the same as auditory memory, visual memory, and visual motor integration on the screening instrument) which were both one standard deviation below the mean. His overall general cognitive index was also one standard deviation below the mean.

Summary: K. P. failed four areas of the screening instrument and was referred for further testing. On the PET he passed all areas and was not referred for further testing. His MSCA scores showed overall low scores with failing scores in two areas and a general cognitive index one standard deviation below the mean. The decision to refer was a correct one.

B. G. 03. This subject was a male, four years and seven months of age. He passed the concept and language development areas of the screening instrument, but he failed visual memory, auditory memory, gross motor, and visual motor performance. In examining his performance on the three year items he passed three out of four of the visual memory items, four out of four of the auditory memory items, four out of four of the gross motor items, and four out of four for the visual motor performance items.

On the PET, B. G. passed five areas but failed gross motor and visual motor performance. On the MSCA, he scored below the mean in all areas and fell one standard deviation below the mean in perceptual

performance, memory, and motor. His GCI was 83 which can be computed to a mental age of three years and eight months.

Summary: B. G. failed four areas of the screening instrument; however, his scores on the three-year-old items indicated he should not be referred for further testing. His score on the PET of two failures indicated that he needed to be referred for further testing. His MSCA scores indicated low score in the motor area. The decision not to refer for further testing based upon his performance on the screening instrument was incorrect. The decision to refer for further testing based upon the PET was correct.

D. K. 04. This subject was a female, age four years, eight months, and four days. She passed four areas of the screening test, but failed auditory memory and gross motor development. In auditory memory she failed two out of four of the four-year-old items but passed all the three-year-old items. In gross motor development she failed three of the four-year-old items and passed all of the three year items. On the PET she passed all areas except gross motor. On the MSCA she passed all the areas with scaled scores of fifty or above except for the motor areas, where her score was forty-three—also a passing score. Her overall general cognitive index was 106, giving her a mental age of approximately five years and one month.

Summary: D. K. failed two areas on the screening instrument; however, her scores on the three-year-old items indicated that she should not be referred for testing. On the PET she failed one area but was not referred for testing. Her MSCA scores indicated that she was

performing within average limits. The decisions not to refer, based on her performance on both the screening instrument and the PET, appear to be correct.

H. B. 05. This subject was a female, age four years and six months. She passed all areas of the screening instrument and missed only one of the sixty items on the test. On the PET she received satisfactory in all areas except for gross motor development where she received an advance. On the MSCA her scores ranged from fifty-four to sixty-six which was within normal limits. Her general cognitive index was 120 which was equivalent to a mental age of approximately five years and six months.

Summary: H. B. passed all areas of the screening instrument and was not referred for further testing. She passed all areas of the PET and was not referred for further testing based on PET results. Her MSCA scores showed that she passed all areas. The decisions not to refer for further testing based on the results of the screening test and the PET appear to be correct.

L. S. 06. This subject was a female, age four years and nine months. She passed all areas of the screening instrument missing only one out of sixty items. On the PET she received satisfactory in all areas except for concept development where she received an advance. On the MSCA her scores were all above the mean except for the motor area where her score was forty-four. She remained within normal limits for all areas of the test and her general cognitive index was 105 which was within normal limits.

Summary: L. S. passed all areas of the screening instrument and was not referred for further testing. She passed all areas of the PET and was not referred for further testing based upon the PET results. Her MSCA scores showed that she passed all areas. The decisions not to refer for further testing based on the results of the screening test and the PET appear to be correct.

T. C. 07. This subject was a female, age four years and three months. She passed the gross motor and concept development areas of the screening test; however, she failed visual memory, auditory memory, visual motor performance, and language development. An analysis of her performance on the three year items shows that she missed two out of four in the visual memory category.

On the PET, she failed the visual motor performance area and language development. She did very poorly on the MSCA, falling below one standard deviation in all areas except in the motor area where she scored two standard deviations below the mean. Her general cognitive index was seventy-two which is converted to a mental age of approximately three years and one month.

Summary: T. C. failed four areas of the screening test and was referred for further testing with the MSCA. She failed two areas of the PET and was referred for further testing. Her MSCA scores showed that she failed all five areas of the test. The decisions to refer for further testing based on test results on the screening test and the PET appear to be correct.

F. G. 08. This subject was a male, age four years and one month. He passed all areas of the screening test except gross motor development.

He failed two out of four of the four-year-old items and two out of four of the three year items. His overall scores on the other six areas of the revised instrument were extremely high. On the PET, F. G. barely passed the gross motor scale. He did poorly on item Balance on One Foot and item Hop; however, he received two points and passed the area. He also passed the other six areas of the PET. On the MSCA his overall scores were high, except for gross motor where he scored one standard deviation below the mean. His general cognitive index was above the mean.

Summary: F. G. failed one area of the screening test and was referred for further testing with the MSCA. He failed one area of the PET and, therefore, was not referred for further testing. His MSCA scores showed that he passed all areas except for gross motor development. The decision to refer, based on the screening instrument, was a correct one. The decision not to refer, based upon the PET results, was incorrect.

K. S. A. 09. This subject was a female, age four years and four months. She passed the visual memory, language and concept development areas of the screening instrument. However, in these areas she had trouble with the item Comparison of Balls and item Recall Three Colors. She failed three areas: auditory memory, visual memory, and gross motor development. She failed most of the items for four-year-olds in these areas and, in addition, failed more than half of the items for three-year-old children. When given the MSCA she scored below the mean in all areas. Her lowest scores were memory and motor which were both

one standard deviation below the mean. When given the PET she failed visual motor performance only. She did very poorly on auditory memory but managed to pass the item Digit Span even though she said nothing for this item. On the PET a child gets one point for this item for very little performance. If she had failed this item she would have failed auditory memory and would have been referred for further testing.

Summary: K. S. A. failed three areas of the revised instrument and was referred for further testing with the MSCA. She failed only one area of the PET and was not referred for further testing. Her MSCA scores showed that she failed two areas. Her overall general cognitive index was ninety-five which computes to a mental age of four years and one month. The decision to refer, based on the revised instrument, was a correct one. The decision not to refer, based on the PET, was incorrect.

C. L. 10. This subject was a female, age four years and four months. She passed four areas on the revised instrument but failed gross motor and visual motor performance. In both gross motor and visual motor she passed only one out of four of the four-year-old items, but she passed all the three year items except one. She passed all areas of the PET. On the MSCA she passed all the areas and scored an overall general cognitive index of ninety. This computes to a mental age of approximately three years and eleven months.

Summary: C. L. failed two areas of the revised instrument; however, her scores on the three-year-old items indicated that she should not be referred for further testing. She passed all areas of the PET and was

not referred for further testing. The MSCA scores indicated that she was performing within normal limits. The decision not to refer, based on her performance on both the screening test and the PET, appears to be correct.

K. J. 11. This subject was a female, age four years and nine months. She passed five areas of the screening test but failed the gross motor area. She scored very well on the three year items, completing four out of four of the three year items in the gross motor area. On the PET K. J. failed concept development but passed the other six areas. On the MSCA she passed all areas except the motor area where she scored thirty-six which is one standard deviation below the mean. Her general cognitive index was ninety-four which is equivalent to a mental age of four years and seven months.

Summary: The decision was made not to refer K. J. for further testing based upon her performance on the three year items on the screening test. She failed only one area on the PET and was not referred based on the criterion of two failures being the cut-off score. Her score on the MSCA indicated that she failed the motor category. The decisions not to refer, based on her performance on the screening instrument and the PET, were incorrect.

A. D. 12. This subject was a female, age four years and nine months. She passed three areas of the screening test but failed visual memory, gross motor, and visual motor. In each of these areas she failed two or more items in the four-year-old section. However, she passed all the three-year-old items in these areas. When given the PET

she passed all items easily. When administered the MSCA she passed all areas. Her overall general cognitive index was ninety-five which computed to a mental age of four years and seven months.

Summary: A. D. failed three areas of the screening test but, because of her excellent performance on the three year items, was not referred for further testing. On the PET she passed all areas and was not referred for further testing. Her MSCA scores showed average scores in all areas and her general cognitive index was average. The decisions not to refer for further testing, based on her performance on the screening test and the PET, were correct.

S. B. 13. This subject was a female, age four years and four months. She passed all areas of the screening test except for auditory memory. An analysis of her performance on the three year items in the auditory memory category showed that she answered three out of four correctly. She passed all areas of the PET. On the MSCA she scored well in all areas and her general cognitive index was within normal limits.

Summary: S. B. passed all areas on the screening test except for auditory memory. Because she did well on the three-year-old items, she was not referred for further testing. She passed all areas of the PET and was not referred for testing. Her MSCA scores showed that she performed well. The decisions not to refer for further testing were correct.

K. B. 14. This subject was a male, age four years and four months. He passed five areas of the screening test—visual memory, gross motor,

visual motor performance, concept development, and language development. He failed auditory memory; however, he got all the three-year-old items correct for the auditory memory area. When given the PET he passed all areas of the test. On the MSCA his scores were within normal limits, his lowest score falling in the memory area. His overall general cognitive index was 100 which computes to a mental age of four years and seven months.

Summary: K. B. failed one area of the revised instrument but was not referred for further testing because of his performance on the three year items. He passed all areas of the PET and was not referred for further testing. His MSCA scores were within normal limits. The decisions, based on her performance on the screening test and the PET, not to refer for further testing appear to be correct.

C. H. 15. This subject was a male, four years and two days old, when first tested with the screening test. C. H. passed all areas of the screening test very easily except for the gross motor area. He had a great deal of difficulty with the three year gross motor items and never was able to stand on one foot for more than one second. This put him at the two year and one-half level in gross motor development. He was very bright and had an extensive vocabulary but couldn't perform in the gross motor area.

On the PET he passed all areas, including the gross motor area. There are only two items on the PET gross motor scale—Stands on One Foot and Hops. He managed to pass the gross motor area on the PET by getting one point for standing on one foot for one second and received

one point for hopping. On the MSCA he performed very well except for the gross motor area where he obtained a score one standard deviation below the mean. His overall general cognitive index was 115 which computes to a mental age of four years and eight months.

Summary: C. H. failed one area on the screening test and was referred for further testing based on his poor performance on the three- and two-year-old items. He passed all the areas on the PET and was not referred for further testing. On the MSCA he failed one area which was the same area failed on the screening test. The decision, based on the revised instrument, to refer for further testing was a correct one. The decision, based on the PET, not to refer for further testing was incorrect.

To summarize the findings of the comparative study, nine children passed the screening test, the PET, and the MSCA. One child passed the screening test and the PET and failed the MSCA. One child passed the screening test, failed the PET, and failed the MSCA. Four children failed the screening test, passed the PET, and failed the MSCA. One child failed the screening test, failed the PET, and failed the MSCA.

The decision to refer or not to refer children for further testing was correct fourteen out of sixteen times using the screening instrument. When using the PET the decision to refer or not to refer for further testing was correct eleven out of sixteen times.

VIII. SUMMARY

The responses of twenty-six children to the sixty items of the pilot test were examined to determine which items were appropriate to

include in the screening test. Using the percentage of children passing as the criterion for selecting the items to remain on the screening tests, the investigator found some items either too difficult or too easy for the age group for which they were designed. Five items were moved to a lower age group because they were too difficult, three items were moved to a higher age group because they were too easy, and six items were replaced with new items.

The final screening test contained sixty items, grouped according to the six functional areas. In each of these areas there were ten items—two for each of the five age groups. For the norming study, the percentage of children within each age group, passing each of the sixty items, was calculated. Nine of the items on the screening test were not passed by 75 percent of the children in the age group for which the items were originally designed, indicating that these nine items need to be revised or replaced with new items.

A point biserial was computed to determine the discriminating power of the items on the screening test. In fifty-six out of the sixty items on the screening instrument the point biserial was positive, indicating that the children who scored well on these items also scored well on the test as a whole. Nine of the items had negative point biserials, indicating that the children who did well on the overall test are not doing well on these items. These items with negative point biserials are misleading in some way and need to be revised or replaced with new items.

The percentage of children within each age group passing each item was calculated according to race, sex, and occupational level of father

and mother. There was no significant difference in the percentage of blacks and whites passing the items except for one item. There were no significant differences in the percentages of males and females passing the items, except for one item in one age group. When the children were grouped according to father's occupation there were only six incidences where the children answered the items significantly different. When the children were grouped according to mother's occupation there were only six instances where the children in the norming sample answered the items significantly different. These results indicate that most of the items were not biased toward children whose fathers and mothers were from different occupational categories.

To determine the relationship between the examiners and their ratings, eleven children were selected to be tested twice. A Fisher exact test was computed for each of the sixty items and in no incidence was it significant at the .01 level of confidence. This indicates that there was no relationship between the examiners and their ratings.

To determine instrument reliability a Kuder-Richardson$_{20}$ was calculated giving a reliability of .938. The split-halves method was used to obtain a reliability coefficient of .932. Both of these reliability coefficients indicate that the screening test gives consistent results.

When comparing the total scores of the screening test with the MSCA a chi-square value of 6.09 was computed which was significant at the .0136 level. The phi was computed as .509 and the contingency coefficient was computed as .453. In eight incidences the functional

areas of the screening test significantly correlated with the functional areas of the MSCA. The phi coefficient was .60 or higher for each of these correlations and the contingency coefficient was .41 or higher, indicating moderately high correlations.

Sixteen children were administered the revised instrument, the PET, and the MSCA for comparative purposes. In three instances the functional areas of the screening test correlated more closely with the MSCA than the PET at the .01 level of significance. A phi coefficient was converted to a chi-square value to test whether there was a significant correlation between the total scores on the screening test and total scores on the PET with total scores on the MSCA. The screening instrument correlated significantly with the MSCA at the .001 level, while the PET correlated significantly with the MSCA at the .01 level. The total scores on the screening test and total scores on the PET correlate significantly with the MSCA.

However, in analyzing the results of the individual case studies, the decision to refer or not to refer children for further testing was correct fourteen out of sixteen times using the screening instrument. When using the PET the decision to refer or not to refer for further testing was correct eleven out of sixteen times. When analyzing the individual test results it appears that the screening test is a more sensitive instrument which allows examiners to make decisions regarding referral for further testing with a greater degree of confidence.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

I. INTRODUCTION

This chapter reviews the information presented in the first three chapters and presents the findings from Chapter IV. Conclusions and specific recommendations are made based on the findings of the norming, reliability, validity, and comparative studies. Recommendations for further studies are presented.

II. SUMMARY

In 1975, the North Carolina General Assembly appropriated over three and one-half million dollars to implement a Statewide Prekindergarten Screening Program during the 1975-77 biennium. This program was designed to identify four-year-old children with developmental disabilities prior to their entrance into kindergarten. Children identified in Phase I screening as developmentally delayed were provided further in-depth testing and services as part of Phase II screening. How a child responded to the Psychoeducations Test (PET), the major instrument used in Phase I screening, was the key determinant of the need for Phase II screening. Thus the sensitivity of this instrument in identifying developmentally disabled children was critical in terms of time, money, and personnel in the screening program.

In initial studies it was found that the PET was not as sensitive as desirable in identifying children with developmental delays. The PET was identifying 37 to 50 percent of the population as needing further testing when in fact a large number of these referrals were false positives. The purpose of this study was to develop a valid and reliable screening instrument which, when compared with the PET, would be more sensitive and would enable examiners to make more accurate decisions concerning referrals for further testing.

In fulfilling the purpose of this study of developing a reliable and valid screening instrument which would be more sensitive than the PET, the following procedures were followed: (1) selection of initial test items, (2) development of the test format, (3) administration of test items, (4) scoring of test items, (5) completion of pilot work for development of the screening test, (6) test revision, (7) selection of the sample population, and (8) statistical tests.

The items selected for the screening test were selected from twelve developmental and preschool tests. The items were selected using the criteria of their face validity, prior standardization, normative data, high interest value, and ease of administration. The items selected were divided into the following six functional areas: visual memory, auditory memory, gross motor development, visual motor performance, language development, and concept development. In each of these areas there were ten items, two for each of the five age groups included in the norming study: two and one-half to three years, three years to three and one-half years, three and one-half years to four years, four years to four and one-half years, and four and one-half to five years.

The procedures for administering the test items were identical to the procedures used in the PET manual. The scoring of the individual test items and the criterion for determining the overall test performance were formulated.

The pilot work involved the determination of children passing the items in each age group. Items not passed by 75 percent of the children in the pilot study were examined again to determine their validity and reliability in previous norming studies. After careful consideration fourteen items were replaced with new items or changed to a different position on the test.

The sample population was selected from children two and one-half to five and one-half years of age living in northwestern North Carolina. This population was used for norming the instrument, testing its reliability, validity, and carrying out the comparative study.

The norming study was conducted on eighty-six children. The percentage of children, within the six age groups, passing each item was calculated. A point biserial was conducted to determine the discriminating power of the items on the screening test. The percentage of children within the six age groups, passing each item, was calculated according to race, sex, and occupation of father and mother.

The inter-rater reliability was determined using the Fisher exact test, the phi coefficient, and the contingency coefficient. The reliability of the screening test was computed using the Kuder-Richardson$_{20}$ and split-halves formulas. The validity study was conducted with a sample of thirty-two children. A chi-square test was

conducted to determine if the screening test and the McCarthy Scales of Children's Abilities (MSCA) were correlated significantly.

A comparative study involving the comparison of scores on the screening test and the PET with scores on the MSCA was conducted. A phi coefficient was computed and converted to a chi-square value for the purpose of determining the significance level of the correlations among the three tests.

III. FINDINGS

The responses of twenty-six children to the sixty items of the pilot test were examined to determine which items were appropriate to include in the screening test. Using the percentage of children passing as the criterion for selecting the items to remain on the screening tests, the investigator found some items either too difficult or too easy for the age group for which they were designed. Five items were moved to a lower age group because they were too difficult, three items were moved to a higher age group because they were too easy, and six items were replaced with new items.

The final screening test contained sixty items, grouped according to the six functional areas. In each of these areas there were ten items—two for each of the five age groups. For the norming study, the percentage of children within each age group, passing each of the sixty items, was calculated. Nine of the items on the screening test were not passed by 75 percent of the children in the age group for which the items were originally designed, indicating that these nine items need to be revised or replaced with new items.

A point biserial was computed to determine the discriminating power of the items on the screening test. In fifty-one out of the sixty items on the screening instrument the point biserial was positive, indicating that the children who scored well on these items also scored well on the test as a whole. Nine of the items had negative point biserials, indicating that the children who did well on the overall test are not doing well on these items. These items with negative point biserials are misleading in some way and need to be revised or replaced with new items.

The percentage of children within each age group passing each item was calculated according to race, sex, and occupational level of father and mother. There was no significant difference in the percentage of blacks and whites passing the items except for one item. There were no significant differences in the percentages of males and females passing the items, except for one item in one age group. When the children were grouped according to father's occupation there were only six incidences where the children answered the items significantly different. When the children were grouped according to mother's occupation there were only six instances where the children in the norming sample answered the items significantly different. These results indicate that most of the items were not biased toward children whose fathers and mothers were from different occupational categories.

To determine the relationship between the examiners and their ratings, eleven children were selected to be tested twice. A Fisher exact test was computed for each of the sixty items and in no incidence

was it significant at the .01 level of confidence. This indicates that there was no relationship between the examiners and their ratings.

To determine instrument reliability a Kuder-Richardson$_{20}$ was calculated giving a reliability of .938. The split-halves method was used to obtain a reliability coefficient of .932. Both of these reliability coefficients indicate that the screening test gives consistent results.

When comparing the total scores of the screening test with the MSCA a chi-square value of 6.09 was computed which was significant at the .0136 level. The phi was computed as .509 and the contingency coefficient was computed as .453. In eight instances the functional areas of the screening test significantly correlated with the functional areas of the MSCA. The phi coefficient was .60 or higher for each of these correlations and the contingency coefficient was .41 or higher indicating moderately high correlations.

Sixteen children were administered the revised instrument, the PET, and the MSCA for comparative purposes. In three instances the functional areas of the screening test correlated more closely with the MSCA than the PET at the .01 level of significance. A phi coefficient was converted to a chi-square value to test whether there was a significant correlation between the total scores on the screening test and total scores on the MSCA. The screening instrument correlated significantly with the MSCA at the .001 level while the PET correlated significantly with the MSCA at the .01 level. The total scores on the screening test and total scores on the PET correlate significantly with the MSCA.

However, in analyzing the results of the individual case studies, the decision to refer or not to refer children for further testing was correct fourteen out of sixteen times using the screening instrument. When using the PET the decision to refer or not to refer for further testing was correct eleven out of sixteen times. When analyzing the individual test results it appears that the screening test is a more sensitive instrument which allows examiners to make decisions regarding referral for further testing with a greater degree of confidence.

IV. CONCLUSIONS

To summarize, the major conclusions of this study were:

1. The majority (fifty-one out of sixty) of the items on the screening instrument were passed by 75 percent of the population for which the items were designed.

2. Based on the statistical tests computed for reliability among raters, it can be concluded that the examiners did not influence the response of the children on the individual items.

3. The statistical tests used in determining instrument reliability indicated that the screening instrument is highly reliable. One can conclude that the test is designed so that any person with adequate training can administer the instrument and obtain the same results as this investigator.

4. Based on the statistical tests computed for the validity study, it can be concluded that the screening test correlated moderately high with the MSCA which is a reliable and valid instrument. Thus, the screening test can be considered to be a valid test.

5. In looking at the results of the comparative study it appears that the screening instrument is a more sensitive instrument than the PET. Decisions to refer or not to refer were correct in fourteen out of sixteen cases using the screening instrument, whereas, decisions to refer or not to refer were correct in eleven out of sixteen cases using the PET.

V. RECOMMENDATIONS

Of the nine items which were not passed by 75 percent of the children in the norming study, three had low percentages and should be revised or replaced with new items. Six of these items had fairly high percentages and might be appropriate to include in the test after they have been researched further on a larger sample of children. The norming study should be replicated, using a larger sample of children, which would stabilize the percentages of children passing the sixty test items.

The nine items on the test with negative biserials need to be examined to determine the characteristics of the items which lend themselves to obtaining a negative biserial. These items may need to be revised or replaced.

In regard to the relationship between the sample and the general population in terms of race, sex, and occupational level of the mother and father, accurate statistics regarding the actual number of blacks and whites need to be utilized in any further studies. If possible, a stratified random sample should be used based on accurate population statistics.

Although the screening instrument correlated moderately high with the MSVA, a valid and reliable instrument, it would be useful to conduct additional studies correlating the screening test with other valid and reliable instruments.

The comparative study should be replicated using a larger sample of children. The sample should include subjects representing all combinations of pass-fails on the three instruments. This would inable the investigator to examine the instances of false positives and false negatives resulting from administrations of the screening test and the PET. It would also be useful to examine the criteria established for passing and failing scores on the screening test and investigate whether the criteria is appropriate.

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APPENDICES

APPENDIX A

TESTS FROM WHICH ITEMS WERE SELECTED

APPENDIX A

TESTS FROM WHICH ITEMS WERE SELECTED

Item No.	Item	Tests
	Visual Memory	
1	Match Like Objects	Stanford-Binet Intelligence Scale Carolina Development Profile
2	Match Drawings	Carolina Development Profile Stanford-Binet Intelligence Scale
3	Copies Letters M & N	Carolina Developmental Profile Maturity Level for School Entrance and Reading Readiness
4	Folds Paper	Stanford-Binet Intelligence Scale Carolina Developmental Profile Learning Accomplishment Profile
5	Adds Parts to Man	Carolina Developmental Profile Stanford-Binet Intelligence Scale
6	Six Piece Puzzle	Stanford-Binet Intelligence Scale Carolina Development Profile Learning Accomplishment Profile
7	Matching Symbols	Carolina Developmental Profile
8	Recognizes Letters	Maturity Level for School Entrance and Reading Readiness
9	Names Objects from Memory	Psychoeducational Test Stanford-Binet Intelligence Scale Carolina Developmental Profile
10	Recall Three Colors	Psychoeducational Test
	Auditory Memory	
11	Repetition of Words	McCarthy Scales of Children's Abilities

Item No.	Item	Tests
12	Repeat Two Digits	Stanford-Binet Intelligence Scale Carolina Development Profile Psychoeducational Test
13	Repeat Simple Sentence	McCarthy Scales of Children's Abilities Psychoeducational Test
14	Repeat Three Digits	Stanford-Binet Intelligence Scale Psychoeducational Test Carolina Developmental Profile
15	Count to Five	Cooperative Preschool Inventory
16	Identify Noise	Psychoeducational Test
17	Repeat Sentence	Carolina Developmental Profile McCarthy Scales of Children's Abilities
18	Repeats Story	McCarthy Scales of Children's Abilities
19	Follows Three Directions	Denver Developmental Screening Test Learning Accomplishment Profile
20	Repeats Tapping Sequence	McCarthy Scales of Children's Abilities
	Gross Motor	
21	Balance on One Foot	Carolina Developmental Profile Bayley Scales of Infant Development Denver Developmental Screening Test
22	Hop on One Foot	Carolina Developmental Inventory Maturity Level for School Entrance and Reading Readiness Bayley Scales of Infant Development Denver Developmental Screening Test
23	Jumps in Place	Bayley Scales of Infant Development Denver Developmental Screening Test Cooperative Preschool Inventory
24	Broad Jump	Denver Developmental Screening Test Carolina Developmental Profile Bayley Scales of Infant Development

Item No.	Item	Tests
25	Sitting from Prone Position	Recommended by a State Consultant for Physical Therapists in North Carolina Learning Accomplishment Profile
26	Finger Touch	Recommended by a State Consultant for Physical Therapists in North Carolina
27	Balance on One Foot Five Seconds	Denver Developmental Screening Test Learning Accomplishment Profile
28	Jumps at Least Two Inches	Carolina Developmental Profile
29	Heel Toe Walk	Denver Developmental Screening Test
30	Skips Using Alternate Feet	Denver Developmental Screening Test McCarthy Scales of Children's Abilities Carolina Developmental Profile Learning Accomplishment Profile Preschool Attainment Record Maturity Level for School Entrance and Reading Readiness
	Visual Motor Performance	
31	Stringing Beads	Stanford-Binet Intelligence Scale Carolina Developmental Profile Learning Accomplishment Profile
32	Tower of Six Blocks	Denver Developmental Screening Test Carolina Developmental Profile Learning Accomplishment Profile
33	Imitates Crayon Stroke	Learning Accomplishment Profile Cooperative Preschool Inventory Bayley Scales of Infant Development Denver Developmental Screening Test Stanford-Binet Intelligence Scale
34	Dumps Raisin from Bottle Spontaneously	Denver Developmental Screening Test
35	Copies Circle	Cooperative Preschool Inventory Denver Developmental Screening Test Carolina Developmental Profile Stanford-Binet Intelligence Scale Preschool Attainment Record

Item No.	Item	Tests
36	Imitates Bridge	Stanford-Binet Intelligence Scale Learning Accomplishment Profile Denver Developmental Screening Test Carolina Developmental Profile
37	Imitates Square Demonstrated	Denver Developmental Screening Test Preschool Attainment Record DASI Carolina Developmental Profile Learning Accomplishment Profile
	Visual Memory Performance	
38	Draws Man—3 Parts	Denver Developmental Screening Test Stanford-Binet Intelligence Scale Learning Accomplishment Profile
39	Copies Cross	Denver Developmental Screening Test Psychoeducational Test DASI Carolina Developmental Profile Learning Accomplishment Profile
40	Picks Longer Line	Psychoeducational Test Denver Developmental Screening Test Carolina Developmental Profile
	Language Development	
41	Names Common Picture	Stanford-Binet Intelligence Scale Verbal Language Scale Carolina Development Profile Bayley Scales of Infant Development Learning Accomplishment Profile Denver Developmental Screening Test
42	Tells Age on Request	Psychoeducational Test Carolina Developmental Profile
43	Identifies Pictures	Carolina Developmental Profile Stanford-Binet Intelligence Scale
44	Comprehends Cold, Tired, and Hungry	Carolina Developmental Profile Denver Developmental Screening Test

Item No.	Item	Tests
45	Follows Directions with Different Preparations	Carolina Developmental Profile Denver Developmental Screening Test Learning Accomplishment Profile
46	Talks about Pictures	Portage Project Checklist Carolina Developmental Profile
47	Repeats Twelve Syllable Sentence	Carolina Developmental Profile McCarthy Scales of Children's Abilities
48	Defines Words in Terms of Use	Carolina Developmental Profile Stanford-Binet Intelligence Scale
49	Picture Vocabulary	Stanford-Binet Intelligence Scale Carolina Development Profile Learning Accomplishment Profile
50	Opposite Analogies	Denver Developmental Screening Test Stanford-Binet Intelligence Scale Portage Project Checklist McCarthy Scales of Children's Abilities Learning Accomplishment Profile
	Concept Development	
51	Identify Objects by Use	Denver Developmental Screening Test Carolina Developmental Profile
52	Train of Cubes	Stanford-Binet Intelligence Scale
53	Matches Three Primary Colors	Psychoeducational Test Carolina Developmental Profile
54	Comparison of Balls	Denver Developmental Screening Test Stanford-Binet Intelligence Scale Carolina Developmental Profile
55	Recognizes Colors	Denver Developmental Screening Test
56	Sorting Buttons	Stanford-Binet Intelligence Scale
57	Comprehension Thirsty/Stoves	Denver Developmental Screening Test Stanford-Binet Intelligence Scale
58	Knows Name	Cooperative Preschool Inventory Psychoeducational Test

Item No.	Item	Tests
59	Comprehension Eyes/Ears	Stanford-Binet Intelligence Scale
60	Look-a-Likes	Carolina Developmental Profile Psychoeducational Test Learning Accomplishment Profile

APPENDIX B

PILOT RECORD FORM

APPENDIX B

PILOT RECORD FORM

VISUAL MEMORY

1. Match Like Objects 2 out of 3
   - cow _____
   - pig _____
   - horse _____

   _____ _____

2. Matches Drawings 2 out of 3

   _____ _____

3. Copies Letters M and N 1-1/2 out of 2
   - M _____
   - N _____

   _____ _____

4. Folds Paper

   _____ _____

5. Adds Parts to Man

   _____ _____

6. Six Piece Puzzle

   _____ _____

7. Matching Symbols

   _____ _____

8. Recognizes Letters

   _____ _____

9. Names Objects from Memory 2 out of 3
   - Spoon _____
   - Penny _____
   - Rock _____

   _____ _____

10. Recall Three Colors
    - Trial 1 _____
    - Trial 2 _____

    _____ _____

11. Repetition of Words 2 out of 3
    - Hello _____
    - Horse _____
    - Kitty _____
    - Dog _____
    - Cup _____

    _____ _____

12. Repeats 2 Digits 2 out of 4
    2-5 _____
    3-6 _____
    1-4 _____
    6-3 _____ _____ _____

13. Repeat Simple Sentence
    Hello _____
    I like ice cream. _____
    I can go. _____ _____ _____

14. Repeats 3 Digits 2 out of 3
    4-2 _____
    6-4-1 _____
    3-5-2 _____
    8-3-7 _____ _____ _____

15. Counts to Five
    Counts to five _____
    Imitates count _____ _____ _____

16. Identifies Noise 2 out of 2
    Clap _____
    Bell _____ _____ _____

17. Repeats Sentence
    The boy said good-by to his dog every morning before he went to school.
    The girl tied a pretty pink ribbon on her doll before she went out. _____ _____

18. Repeats Story
    _____ _____

19. Follows Directions 3 out of 3
    Pencil on chair _____
    Open door _____
    Brings small box _____ _____ _____

20. Tapping Sentence
    1234 _____
    1 34 _____ _____ _____

GROSS MOTOR

21. Balances on One Foot
    1 foot for 1 second _____ _____

22. Hops on One Foot
    2 hops on 1 foot _____ _____

23. Jumps in Place
    Both feet on the ground _____ _____

24. Broad Jump
    Jumps once both feet together _____ _____

25. Sitting from Prone Position _____ _____

26. Finger Touch _____ _____

27. Balance on One Foot Five Seconds 2 of 3 _____ _____

28. Jumps at Least Two Inches _____ _____

29. Heel Toe Walk 2 of 3 _____ _____

30. Skips using Alternate Feet _____ _____

VISUAL MOTOR PERFORMANCE

31. Stringing Beads
    Strings four beads _____ _____

32. Tower of Six Blocks
    Balances 6 blocks _____ _____

33. Imitates Crayon Stroke
    Makes horizontal stroke _____
    Makes verticle stroke _____ _____ _____

34. Dumps Raisin from Bottle Spontaneously
    Dumps raisin _____ _____

35. Copies Circle _____ _____

36. Imitates Bridge _____ _____

37. Imitates Square Demonstrated _____ _____

38. Draws Man - 3 parts
    3 body parts _____
    4 body parts _____
    5 body parts _____
    6 body parts _____ _____ _____

39. Copies _____ _____

40. Pick Long Line _____ _____

LANGUAGE DEVELOPMENT

41. Names Common Pictures
    - dog _____
    - ball _____
    - engine _____
    - bed _____
    - doll _____
    - scissors _____ _____ _____

42. Knows Age
    - verbal _____
    - fingers _____ _____ _____

43. Touches Pictures 2 out of 3
    - sleeping _____
    - running _____
    - eating _____ _____ _____

44. Comprehends Cold, Tired, and Hungry
    - cold _____
    - tired _____
    - hungry _____ _____ _____

45. Follows Directions with Three Different Prepositions
    - on _____
    - under _____
    - behind _____
    - front _____
    - beside _____ _____ _____

46. Talks about Pictures 2 out of 3 _____ _____

47. Repeats 12 Syllable Sentence _____ _____

48. Defines Words in Terms of Use
    - bed _____
    - chair _____
    - car _____
    - cookie _____
    - book _____ _____ _____

49. Picture Vocabulary 4 out of 6

50. Opposite Analogies 3 out of 5
    - girl _____
    - dark _____
    - woman _____
    - fast _____
    - night _____ _____ _____

CONCEPT DEVELOPMENT

51. Identifying Objects 3 out of 6			
cup _____			
shoe _____			
penny _____			
knife _____			
auto _____			
iron _____	_____	_____	
52. Copy Train			
exact copy _____			
3 blocks _____	_____	_____	
53. Matches Colors			
red _____			
blue _____			
green _____			
yellow _____	_____	_____	
54. Comparison of Balls	_____	_____	
55. Recognized Colors 3 out of 4			
red _____			
blue _____			
green _____			
yellow _____	_____	_____	
56. Sorts Buttons	_____	_____	
57. Comprehension			
thirsty _____			
stoves _____	_____	_____	
58. Knows Name			
yes _____			
no _____	_____	_____	
59. Concept Development			
eyes _____			
ears _____	_____	_____	
60. Look Alikes	_____	_____	

APPENDIX C

GENERAL TESTING GUIDELINES

APPENDIX C

GENERAL TESTING GUIDELINES

The PET is designed to be administered in a standarized manner. Full administration of the test should run between twenty and thirty minutes. Although specific instructions are given for the administration of each item, the following guidelines are included to provide an overall orientation to the testing situation.

Rapport: The screening test relies completely on what the child can do while he is being examined. Since active participation is required by the child, every effort should be made to put the child at ease. It is generally helpful if the examiner approaches the child confidently, assuming that the child will enjoy doing the various tasks which are going to be presented. The examiner should be satisfied that the child is relatively at ease before proceeding to the test items. The following suggestions may be helpful in establishing and maintaining rapport:

1. Become completely familiar with all aspects of the test (administration, scoring, profiling). This will permit you to focus your attention on the child and will prevent awkward pauses during testing. Four-year-olds are generally quite active and unnecessary pauses are likely to impede the testing.
2. Introduce yourself to the child with a warm, friendly smile.
3. Tell the child you are going to show him some pictures, play some games, ask him some questions, and so forth.
4. If a child resists coming with you or refuses to cooperate anymore, try to gently encourage him to participate (e.g., "Oh, I think you're going to like these games." "Let's try it a little longer," and so forth.) If the child asks for help, reply "I want to see how well you can do it all by yourself." Sometimes allowing a child to play with a toy puts him more at ease. If all attempts to establish a working relationship with the child are futile, say to the child, "Maybe another day you'll feel like trying my games," or "We can try again another day," and take the child back to his room or his parent.
5. It is often helpful in working with four-year-olds to make direct statements telling them what you want to do rather than asking them if they want to do something.

For example, saying, "I want you to draw a picture of a man" is preferable to "Do you want to draw a man for me?"

6. Try to make your interaction with the child interesting and enjoyable. It is also important to maintain a reasonably serious attitude. Striking a balance between these two orientations will come with experience.

Test Administration: The examiner should make every effort to administer the items in the order they are presented in the manual. However, this orderly presentation should not be followed in a rigid or stilted manner. Once good rapport has been achieved, the examiner should attempt to make the entire session a natural and pleasant exchange with the child. When making a transition between test items, such remarks as "Let's go on to the next one," or "Now I'm going to show you something different," or asking the child to replace an item in its container can facilitate the screening without being distracting.

Occasionally, the examiner may administer an item out of order (for example, if a child is not responding to any verbal directions, you may administer a gross motor item). The examiner may occasionally repeat a test item (for example, if the child has made no response whatsoever to a question or a direction). Nevertheless, in general, the examiner should follow the specific directions for administration as closely as possible. Whenever the standard administration has been changed, the examiner should make a note on the child's record form.

After all of the mandatory items have been administered, the examiner lets the child play briefly while determining which supplemental items will be administered. The specific directions for the administration of supplemental items are included in the administration manual for the PET. The examiner should become thoroughly familiar with these procedures to facilitate test administration.

If a child spontaneously changes an answer from wrong to right, he receives credit for the item. If he spontaneously changes an answer from right to wrong, his wrong answer is recorded and scored as wrong. If a child gives an ambiguous answer or has trouble deciding which is the correct answer between two or more options (for example, if the child places his finger between two lines when asked to identify the longer one), probe further so that you have some basis on which to score the child's response (e.g., "Put your finger on the one that is longer").

APPENDIX D

SCREENING TEST

APPENDIX D

SCREENING TEST

VISUAL MEMORY

Age: Four years and six months to five years

1. RECALL THREE COLORS 1/2

Materials: Three blocks: red, yellow, and blue

Procedure: Say: "Look at these colors." Place the blocks in the sequence of blue, red, and yellow from the child's left to right. Say: "I'm going to put one here (blue), one here (red), and one here (yellow)." "Now I'm going to mix them up and I want you to put them back just like this" (pointing to the sequence from the child's left to right). "This color here (blue), this color here (red), and this color here (yellow)." Pause ten seconds. Mix up the blocks and hand them to the child. Say: "Now you do it; put the colors just like mine were." If the child replaces the colors in the correct sequence proceed to the next item, otherwise, continue with another sequence. Allow two trials.

Scoring: Pass if the child assembles one of the sequences correctly.

Age: Four years and six months to five years

2. PICTORIAL MEMORY 3/6

Materials: Card with pictures

Procedure: Say: "I'm going to show you a picture of some things. Then I will take it away and see how many of the things you can remember. Here they are." Show the child the card and begin naming the items. Point to each one of the objects and say: "Look carefully. We have a button, a fork, a paper clip, a horse, a padlock, and a pencil." Allow a few seconds for the child to look at the objects. Remove the card and say: "Now tell me what you saw." Allow about three minutes. If the child hesitates after naming only 1 or 2 objects, say: "And what else?" or "Try to tell me some more of them."

Scoring: Baby words are not acceptable except for horsie. Do not give credit if the child says pen instead of pencil or locker instead of padlock. Pass if the child names three objects.

Age: Four years to four years and six months

3. RECOGNIZES LETTER

Materials: Card with letters

Procedure: Place the sheet of paper in front of the child. Say: "See this paper. It has letters on it. Do you know any of these letters?" If the child identifies a letter, ask if there are any other letters the child knows.

Scoring: Pass if the child identifies one letter.

Age: Four years to four years and six months

4. SIX PIECE PUZZLE

Materials: Six piece puzzle

Procedure: Say: "I have a puzzle for you to play with. Let's take the pieces out of the puzzle. Watch me put the puzzle together. Now, can you put the pieces back in the puzzle?"

Scoring: Pass if the child assembles all pieces correctly.

Age: Three years and six months to four years

5. MATCHING SYMBOLS 4/4

Materials: Laminated card with symbols

Procedure: Say: "I am going to play another game with you. Look at the picture on this card. Can you find another picture that looks just like this one?" (point out pictures to the child). "That's right, this one is just like the picture on the bottom." Repeat the directions for each of the pictures.

Scoring: Pass if the child matches all four symbols.

Age: Three years and six months to four years

6. ADDS PARTS TO MAN

Materials: Picture of incomplete man

Procedure: "See this man. Something is missing isn't it? Can you finish this picture?"

Scoring: Pass if the child adds a part to the man.

Age: Three years to three years and six months

7. COPIES M OR N 1/2

Materials: Crayon and paper

Procedure: Let the child scribble on the paper. Then say: "Look what I can do. Can you draw this: up, down, up, down? See if you can do this." Repeat the directions for the second letter.

Scoring: Pass if the child replicates either letter. If the child copies the letter backwards no credit is given.

Age: Three years to three years and six months

8. FOLDS PAPER

Materials: One sheet of paper

Procedure: Take a sheet of paper and say: "See what I am doing with this paper. I am folding it to make a book. Here is a sheet of paper. See if you can make a book too."

Scoring: Pass if the child folds the sheet in half. Do not pass if the fold is on an angle.

Age: Two years and six months to three years

9. IDENTIFYING PARTS OF BODY 4/7

Materials: Card with picture of child

Procedure: Show the card to the child and say, "Show me the boy's hair." Repeat the directions for the mouth, feet, ear, nose, hands, and eyes.

Scoring: Pass if the child names four parts.

Age: Two years and six months to three years

10. MATCHES LIKE OBJECTS 2/3

Materials: Picture cards of animals: cow, cat, and dog

Procedure: Tell the child that we are going to look at some pictures. Say: "This is a cow. Can you find another animal that looks like a cow? This is a cat. Can you find another animal that looks like a cat? This is a dog. Can you find another animal that looks like a dog?"

Scoring: Pass if the child correctly matches two out of three animals.

AUDITORY MEMORY

Age: Four years and six months to five years

11. TAPPING SEQUENCE 2/2

Materials: Xylophone and mallet

Procedure: Place the xylophone in front of the child, with the larger end at his left. Say: "Watch and listen very carefully and see if you can play the same tune I do." Consider the largest key as number one and tap the keys sharply with the mallet, about one tap per second, in the sequence one-two-three-four. Hand the mallet to the child and say: "You play that." If he fails to tap each note just once and in the correct order take the mallet from him and give a second demonstration and say: "No, not that way. Watch and do it just the way I do." Allow a third trial, if necessary, also preceded by a demonstration. Next try the following sequence: One-three-four.

Scoring: Pass if the child gets both of the sequences correct.

Age: Four years and six months to five years

12. REPEATS STORY

Materials: Card with story

Procedure: Read the story slowly and clearly. Say, "Now I am going to read you a little story. Listen carefully and we will see how well you can tell it back to me. You don't have to tell it back to me word for word. Just tell me the story as well as you can."

One day after school Bob was walking to the store. On the way he saw a woman carrying some letters to a mailbox. Suddenly, the wind blew the woman's letters into the street. Bob shouted, "I'll get them for you!" He looked both ways and saw that there were no cars coming. He ran into the street and picked up all the letters. The woman was very happy to get her letters back. She thanked Bob for being such a kind and helpful boy.

Scoring: Pass if the child tells three things that happened in the story.

Age: Four years to four years and six months

13. FOLLOWS THREE DIRECTIONS 3/3

Materials: A chair, a pencil, and a door

Procedures: Arrange the setting before beginning the test; that is, see that a chair is available, the door open (or shut), and a small box in place, all in plain sight. Have the child accompany you to the center of the room, saying: "Now I want you to do some things for me." Make sure that you have the child's attention as you continue the instructions. Say: "Here is a pencil. I want you to put it on the chair, then I want you to shut (or open) the door, and then bring me the box which you see over there." Point to each object designated and make sure the child understands the directions.

Scoring: Pass if the child follows the three directions in consecutive order.

Age: Four years to four years and six months

14. REPEAT SENTENCE 1/2

Materials: None

Procedure: "Now I am going to say some words and I want to see how many of them you can say after me. Wait until I have finished saying all the words before you start to answer. Listen. The boy said good-by to his dog every morning before he went to school." And now say: "The girl tied a pretty pink ribbon on her doll before she went out."

Scoring: Pass if the child mentions most of the key words in either sentence. The child can leave out one key word in either sentence and pass.

Age: Three years and six months to four years

15. IDENTIFY NOISE

Materials: bell

Procedure: Say: "Now we're going to play a game listening with our ears. Turn around and cover your eyes with your hands. Now listen very carefully. Tell me what makes this sound." (a) Clap hands three times firmly, about 18" behind the child's head at midline. Clap fingers of right hand on palm of left hand for sharp sound. "Tell me what makes this sound?" (b) Ring bell three times sharply, keeping the bell concealed under the table. Say: "Tell me what makes this sound?"

Scoring: Pass if the child identifies both sounds. If the child says hands, for the clapping sound, give credit.

Age: Three years and six months to four years

16. COUNTS TO FIVE

Materials: None

Procedure: Say: "Now I want to hear you count. Can you count to five?" (If the child cannot count, count for him.) See if the child can imitate the count if he cannot count spontaneously.

Scoring: Pass if the child counts, or imitates, a count to five.

Age: Three years to three years and six months

17. REPEATING THREE DIGITS 2/3

Materials: None

Procedure: Say: "Listen; say four-two. Now say six-four-one," and so forth. Pronounce the digits distinctly and with perfectly uniform emphasis at the rate of one per second: (a) three-five-two, and (b) eight-three-seven.

Scoring: Pass if the child repeats two of the three sequences.

Age: Three years to three years and six months

18. REPEATS SIMPLE SENTENCE 1/3

Materials: None

Procedure: Say: "(Child's name), we're going to say some things now. I want you to say just what I say. Let's try it. Say hello." (Pause while the child repeats and record his answer.) "Say I like ice cream. Say I can go."

Scoring: Pass if the child repeats one sentence.

Age: Two years and six months to three years

19. REPEATS TWO DIGITS 2/4

Materials: None

Procedure: Say: "Listen carefully. I'm going to say some numbers and when I'm through, you say them right after me. If I say two-five, what do you say?" If the child does not respond or responds incorrectly, say "You say two-five." Then say, "Okay, three-six." If the child does not respond or responds incorrectly, say "You say three-six." Then say "OK, now listen carefully, one-four . . . six-three."

Scoring: Pass if the child can repeat two correct sequences.

Age: Two years and six months to three years

20. REPETITION OF WORDS 2/5

Materials: None

Procedure: "We're going to say some words now. I want you to say just what I say. Let's try it. Say hello; Say horse; Say kitty; Say dog; and Say cup."

Scoring: Pass if the child says at least two words.

GROWW MOTOR DEVELOPMENT

Age: Four years and six months to five years

21. SKIPS USING ALTERNATE FEET

Materials: None

Procedure: Demonstrate skipping. Say: "See what I'm doing. Can you do this?"

Scoring: Pass if the child can skip using alternate feet (not hopping).

Age: Four years and six months to five years

22. HEEL-TO-TOE WALK 2/3

Materials: None

Procedure: Show the child how to walk placing the heel of one foot in front of and touching the toe of the other. Walk about eight steps like this and tell the child to do it. (The tester may compare this to a tight rope walk.) If the child does not respond, show him how to do it again. The child must be given three trials.

Scoring: Pass if the child can walk in a straight line for four or more steps placing his heel one inch or less in front of his toe. Two out of three trials.

Age: Four years to four years and six months

23. RUNNING BROAD JUMP

Materials: Masking tape

Procedure: Place the tapes 23 inches apart. Tell the child to stand back from the first line and take a running jump. The child must jump over the second tape.

Scoring: Pass if the child jumps 23 inches. The child can jump or leap the distance.

Age: Four years to four years and six months

24. BALANCE ON ONE FOOT FIVE SECONDS

Materials: None

Procedure: Show the child how to stand on one foot without holding on and say: "Can you do this?" The child must be given three trials.

Scoring: Pass if the child can stand on one foot for five seconds or more in two out of three trials.

Age: Three years and six months to four years

25. WALKS BACKWARDS TEN FEET

Materials: Masking tape

Procedure: Demonstrate walking backwards for ten feet along a line. The child's feet need not stay on the line, but the general direction along the tape should be maintained for a pass.

Scoring: Pass if the child walks backwards ten steps.

Age: Three years and six months to four years

26. SITTING FROM A PRONE POSITION

Materials: None

Procedure: Ask the child to lie on the floor. When the child is relaxed, tell the child to stand up. Observe if the child can pull himself forward to a sitting position with little or no sidewise turning, and then stand upright.

Scoring: Pass if the child can pull himself forward to a sitting position and stand upright with little or no sidewise turning. The child may use one hand for balance but not two hands and his body. Give two trials.

Age: Three years to three years and six months

27. HOPS ON ONE FOOT TWICE

Materials: None

Procedure: Demonstrate hopping on one foot. Tell the child to hop at least two times.

Scoring: Pass if the child completes two or more hops on one foot. If the child is unsuccessful, have the child use his other foot.

Age: Three years to three years and six months

28. BROAD JUMP

Materials: Piece of paper 8-1/2" by 11".

Procedure: Place a test form on the floor and show the child how to do a standing broad jump across the width of the paper (8-1/4"), then tell him to do it. Give three trials. The child must jump over the paper.

Scoring: Pass if the child jumps over the paper with both feet.

Age: Two years and six months to three years

29. JUMPS IN PLACE

Materials: None

Procedure: Tell the child to jump. Demonstrate.

Scoring: Pass if the child raises both feet off the floor at the same time for any measurable distance. He does not have to land in the same spot from which he started. (The child cannot run before he jumps, or hold on to anything for support.)

Age: Two years and six months to three years

30. BALANCES ON ONE FOOT

Materials: None

Procedure: Demonstrate standing on right foot. Say: "See what I'm doing. Can you do this?" Arms can be extended horizontally or touching body. Ask the child to do the same on the unpreferred foot.

Scoring: Pass if the child can balance on one foot for one second.

VISUAL MOTOR INTEGRATION

Age: Four years and six months to five years

31. PICKS LONGER LINE 3/3 or 5/6

Materials: Card with vertical lines

Procedure: Place card on the table and direct the child's attention to the lines with a finger and say, "Look at these lines. Show me which line is longer." (Do not say "bigger.") Turn the paper around and repeat pointing and the question. Continue until the child gets three out of the first three, or misses a total of three trials. The child should always see the lines as vertical.

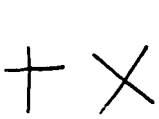
Age: Four years and six months to five years

32. COPIES

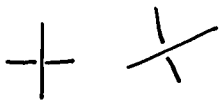
Materials: Pencil and paper, card with cross

Procedure: Show the cross to the child. Do not name it or move your finger or pencil to show how to draw it. Tell the child to draw one like the picture.

Scoring: Pass if the child draws two lines which intersect at any point. The lines do not need to be exactly straight.



Pass



Fail because the lines do not intersect

Age: Four years to four years and six months

33. IMITATES SQUARE DEMONSTRATED

Materials: Pencil and paper, card with square

Procedure: First see if the child can copy from the picture without being shown. Show the square to the child. Do not name it or move your finger or pencil to show how to draw it. Tell the child to draw one like the picture. If he is unable to copy the picture, the tester should show him how by drawing two opposite sides first and then the other two opposite sides rather than drawing the square with a continuous motion.

Scoring: Pass if the child draws a figure with four square corners. The corners may be formed by lines that intersect, but the corners must be approximately right angles (⌊) and not rounded ( )) or pointed (⌟).

Age: Four years to four years and six months

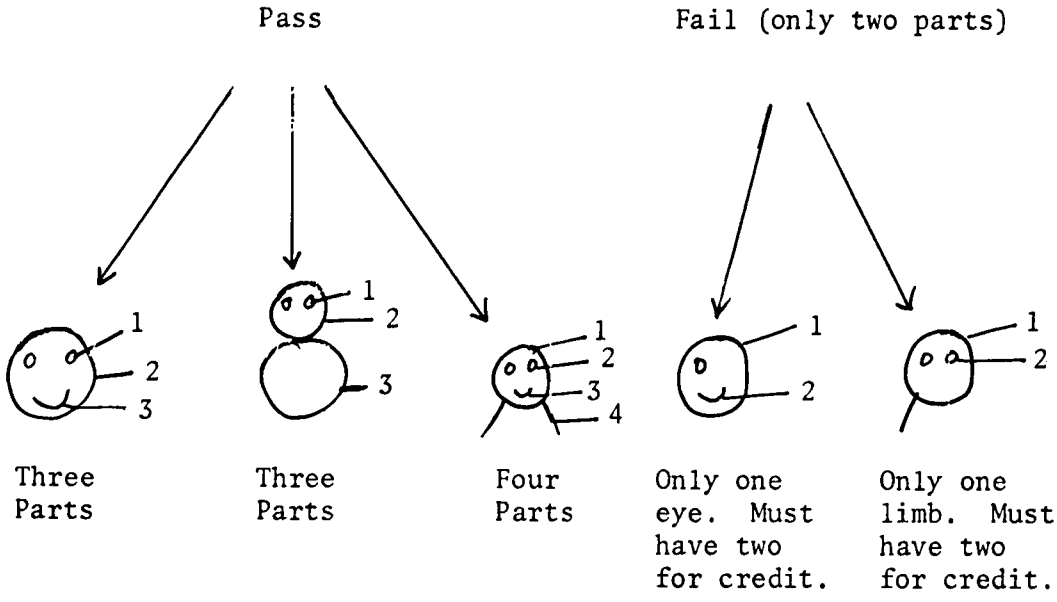
34. DRAWS MAN—THREE PARTS

Materials: Pencil and paper

Procedure: Give the child pencil and paper and tell him to draw a picture of a boy or girl (man or woman). Do not tell him to add other parts to his drawing. When he seems to have finished his drawing, ask "Are you finished?" If the child answers "yes," score the drawing.

Scoring: Pass if the child has drawn three or more body parts. One point is given for each pair (ears, eyes, and so forth) as well

as for each part which is not a pair (head, neck, body, and so forth). If one part of a pair is not drawn, it is not counted.



Age: Three years and six months to four years

35. IMITATES BRIDGE

Materials: Blocks

Procedure: The tester should tell the child to watch closely while the tester builds a bridge. Place two blocks side by side with less than a block's space between, but not touching. Place a third block on top of these so that it covers the space between. The tester then gives three blocks to the child and tells him to build a bridge like the one the tester built. The bridge should be left standing for the child to copy. The tester should not point out the opening.

Scoring: Pass if the child copies the block bridge that the tester built. If the two blocks on the bottom of the bridge are touching, ask the child, "Is your bridge like my bridge?" If the child's bridge is not right, the tester should not give hints to the child for correcting his error.

Age: Three years and six months to four years

36. COPIES CIRCLE

Materials: Pencil and paper, circle card

Procedure: Show the circle to the child. Do not name it or move your finger or pencil to show how to draw it. Say: "Draw one just like this picture."

Scoring: Pass any enclosed form that is not made up of continuous round motions.



Pass



Continuous Round Motions



Not Closed

Fail

Age: Three years to three years and six months

37. FORMBOARD

Materials: Shape formboard.

Procedure: Take the shapes out of the formboard. Say: "Can you put the shapes back in the right place?"

Scoring: The child must place all the pieces in the correct place.

Age: Three years to three years and six months

38. TOWER OF SIX BLOCKS

Materials: Twelve blocks

Procedure: Place blocks on the table in front of the child. The tester may encourage him to stack the blocks one upon the other as high as he can by showing the child how and/or handing the child he blocks. The child may have up to three trials.

Scoring: Pass if the child balances six blocks on top of one another so that they do not fall.

Age: Two years and six months to three years

39. IMITATES CRAYON STROKE

Materials: crayon and sheet of paper

Procedure: After giving the child an opportunity to scribble spontaneously, take a new piece of paper and draw a straight

vertical line, moving the crayon rapidly toward the child while saying, "See, it goes zip! You do it." Repeat several times, if necessary, indicating by gestures that he is to imitate. After the child has attempted the vertical stroke, make a horizontal stroke, moving from your right to left while saying "Now make it go this way. You do it." Note the orientation of any strokes produced by the child.

Scoring: Pass if on any trial the child makes a definite stroke in any direction. The line should be at least one inch long and does not have to be perfectly straight.

VISUAL MOTOR PERFORMANCE

Age: Two years and six months to three years

40. STRINGING BEADS

Materials: Box of large kindergarten beads and string

Procedure: String one bead saying, "Now let's play this game. Watch." Then giving the child another string, say "Let's see how many we can put on one." Continue stringing beads while the child works on his chain, urging as often as necessary to keep the child trying. Time limit is two minutes.

Scoring: Pass if the child strings four beads.

LANGUAGE DEVELOPMENT

Age: Four years and six months to five years

41. OPPOSITE ANALOGIES 3/5

Materials: None

Procedure: Say (a) "Brother is a boy; sister is a _____."
(b) "In daytime it is light; at night it is _____."
(c) "Father is a man; mother is a _____."
(d) "The snail is slow; the rabbit is _____."
(e) "The sun shines during the day; the moon at _____."

Scoring: Pass is the child answers three out of five correctly. You may repeat the question at the end of the sequence if the child misses one of the analogies.

Age: Four years and six months to five years

42. PICTURE VOCABULARY 14/16

Materials: Card with pictures

Procedure: Place the card in front of the child. Say "What's this? What do you call it?" Pass if the child names fourteen pictures correctly.

Scoring: Pass if the child names fourteen pictures correctly.

Age: Four years to four years and six months

43. DEFINES WORDS IN TERMS OF USE 3/5

Materials: None

Procedure: Ask the child the meaning of familiar words in terms of use. Ask: "What is a bed? What do we use it for?" The child should answer to sleep on. Ask: "What is a chair?" (To sit on) Ask: "What is a car?" (To ride in) Ask: "What is a cookie?" (To eat) "What is a book?" (To read).

Scoring: Pass if the child answers three out of five. No extra probing.

Age: Four years to four years and six months

44. TALKS ABOUT PICTURES 2/3

Materials: Three pictures

Procedure: Present three culturally relevant pictures, one at a time, to the child. Say: "Can you tell me what's happening in this picture?"

Scoring: For a pass the child should be able to name at least three objects in each picture and describe some element. (Example: The boy is wearing a hat; they are having a party, and so forth.)

Age: Three years and six months to four years

45. REPEATS TWELVE SYLLABLE SENTENCE 1/2

Materials: None

Procedure: Ask the child to say "Spot is a good boy" (example). Use this sample to make the task expectation clear to the child. Say: "When a train passes, you will hear the whistle blow. We are going to have a good time in the country." Pronounce each word clearly, in a normal manner.

Scoring: Pass if the child repeats one sentence correctly.

Age: Three years and six months to four years

46. FOLLOWS DIRECTIONS 3/3

Materials: Small box and chair

Procedure: Ask the child the following question: "Put the block on the chair. Put the block under the chair. Put the block behind the chair. Put the block in front of the chair. Put the block beside the chair." Look at the child while giving the directions; do not accompany directions with gestures. Repeat directions if necessary, but allow only one attempt per direction.

Scoring: Pass if the child gets three correct.

Age: Three to three years and six months

47. COMPREHENDS COLD, TIRED, AND HUNGRY 3/3

Materials: None

Procedure: Ask the child the following questions, one at a time: "What do you do when you are tired?" (go to sleep, sit down, rest). "What do you do when you are cold?" (put on a coat, go inside, turn up the furnace). (Do not pass if he answers this question with "cough," "take medicine," or any answer about having a cold.) "What do you do when you are hungry?" (eat, have supper, ask for something to eat).

Scoring: Pass if the child gets all three correct.

Age: Three to three years and six months

48. IDENTIFYING PICTURES 2/3

Materials: Pictures designating action

Procedure: Ask the child to touch the picture of the child (a) sleeping, (b) running, and (c) eating. Pictures should be culturally familiar.

Scoring: Pass if the child points to two out of three pictures.

Age: Two years and six months to three years

49. TELLS NAME

Materials: None

Procedure: Ask the child: "What is your name?" Should the child give only his first name, say: "What is the rest of your name?" or "What is your other name?"

Scoring: Pass if the child gives you his first and last name.

Age: Two years and six months to three years

50. PICTURE VOCABULARY

Materials: Card with pictures

Procedure: Place the card in front of the child. Say: "What is this? What do you call it?"

Scoring: Pass if the child names eight pictures correctly.

CONCEPT DEVELOPMENT

Age: Four years and six months to five years

51. LOOK ALIKES 3/5

Materials: Five sets of drawings in plastic sheets, each containing a sample picture

Procedure: Say, "I am going to show you a picture and three more pictures under it." (Sweep finger across the row of pictures.) "I want you to look at the top picture, and then point to one of these pictures which looks like the top picture.) If the child matches correctly, say "Good. This picture looks just like that one." If the child points incorrectly, correct him by saying "No, this is the picture which looks like the top one." (Point to the sample.) Proceed with the five test items in the following manner.

Scoring: Pass if the child gets three out of five correct.

Age: Four years and six months to five years

52. COMPREHENSION 2/2

Materials: None

Procedure: Ask: (a) "What do we do with our eyes?"
(b) "What do we do with our ears?"

Scoring: Pass if the child answers both questions correctly. Correct responses are (a) look around, see with them, wink, and so forth; and (b) listen with them, hear with them, and so forth.

Age: Four years to four years and six months

53. KNOWS AGE

Procedure: Ask: "How old are you?"

Scoring: The child must say his correct age clearly. He may use a show of fingers to represent his age.

Age: Four years to four years and six months

54. COMPREHENSION 2/2

Materials: None

Procedure: Ask: (a) "What must you do when you are thirsty?"
(b) "Why do we have stoves?"

Scoring: Acceptable answers are (a) get a drink, get some water or juice, and so forth; and (b) to cook on, to cook with, to keep warm, and to put wood in to burn. The child must answer both questions to pass.

Age: Three years and six months to four years

55. RECOGNIZES COLORS 3/4

Materials: Four small blocks: red, blue, green, and yellow

Procedure: Place a red, blue, green, and yellow block on the table in front of the child. Say: "Which block is red?" or "Show me the red block." If the child hands the block to the tester, the block should be replaced on the table before the next color is asked for.

Do not let the child know if his responses are right or wrong. Do not ask the child to name the colors.

Scoring: Pass if the child picks three of the four colors correctly.

Age: Three years and six months to four years

56. SORTING BUTTONS

Material: Twenty half-inch buttons, 10 black and 10 white; Small box

Procedure: Empty the button box onto the table in front of the child and place the box cover beside the box ready for sorting the buttons. Take a button of each color from the mixed pile in front of the boxes and say as you illustrate: "See, the black buttons go in this box, and the white buttons go in that box. Now you put all the black buttons in that box and all the white buttons in this box." Time limit is two minutes.

Scoring: Pass if the child makes no errors sorting the buttons. If an error is made in the process of sorting and is corrected spontaneously, disregard in scoring.

Age: Three years to three years and six months

57. COMPARISON OF BALLS 3/3 or 5/6

Materials: Card with large and small spheres

Procedure: Show the card and ask, "Which ball is bigger? Put your finger on the big one." Give three trials alternating the relative positions of the large and small balls. In case one of the first three trials is failed, give three additional trials, continuing to alternate the positions of the balls.

Scoring: The child must get three out of three trials, or five out of six trials.

Age: Three years to three years and six months

58. MATCHES THREE PRIMARY COLORS 4/4

Materials: Two red blocks, two blue, two yellow, and two green

Procedure: Put ten cubes on the table. Then place four in a row while saying "Look how I make a train; like this, and this, and this, and here is the engine." (Place a fifth cube on top of the first for the engine.) "See how it goes." Push the train about the table while saying "Choo-choo-choo." Push the five other cubes toward the child with the request: "You make one. Make a train like mine."

Scoring: Pass if the child duplicates the train.

Age: Two years and six months to three years

60. IDENTIFIES OBJECTS BY USE

Materials: Card with five pictures

Procedure: Show the child the care with five pictures (car, stove, bed, coat, fork). Say: "What do we eat with?"
"What do we ride in?"
"What do we cook on?"
"What do we wear?"
"What do we sleep in?"

Scoring: Pass if the child points to three correct pictures. Allow one trial each.

APPENDIX E

SCREENING TEST ANSWER SHEET

APPENDIX E

SCREENING TEST ANSWER SHEET

VISUAL MEMORY

(4) RECALL THREE COLORS (1/2)

Trial 1_____

Trial 2_____ (1)_____

(4) PICTORIAL MEMORY (3/6)

Button_____

Fork_____

Paper Clip_____

Horse_____

Padlock_____

Pencil_____ (2)_____

(4) RECOGNIZES LETTERS (1/2)

M_____

N_____ (3)_____

(4) SIX PIECE PUZZLE (4)_____

(3) MATCHING SYMBOLS (4/4)
(5)_____

(3) ADDS PARTS TO MAN (6)_____

(3) COPIES M OR N (1/2)

M_____

N_____ (7) _____

(3) FOLDS PAPER (8)_____

(2) IDENTIFYING PARTS (3/5)

Hair_____

Mouth_____

Feet_____

Ear_____

Nose_____

Hands_____

Eyes_____ (9)_____

(2) MATCHES LIKE OBJECTS (2/3)

Cow_____

Cat_____

Dog_____ (10)_____

AUDITORY MEMORY

(4) TAPPING SEQUENCE (1/2)

1-2-3-4_____

1-3-4_____ (11)_____

(4) REPEATS STORY (12)_____

(4) FOLLOWS THREE DIRECT (3/3)

Pencil_____

Chair_____

Door_____ (13)_____

(4) REPEAT SENTENCE (14)_____

(3) IDENTIFY NOISE (2/2)

Bell_____

Clap_____ (15)_____

(3) COUNTS TO FIVE (16)_____

(3) REPEATS THREE DIGITS (2/3)

6-4-1_____

3-5-2_____

8-3-7_____ (17)_____

(3) REPEATS SENTENCE (1/3)

I like ice cream.____

I can go._____(18)_____

(2) REPEATS TWO DIGITS (2/3)

2-5_____

3-6_____

1-4_____

6-3_____ (19)_____

(2) REPETITION OF WORDS (2/4)

Hello_____

Horse_____

Kitty_____

Dog_____

Cup_____ (20)

GROSS MOTOR DEVELOPMENT

(4) SKIPS (1/2)
Trial 1_____
Trial 2_____ (21)_____

(4) HEEL TOE WALK (2/3)
Trial 1_____
Trial 2_____
Trial 3_____ (22)_____

(4) RUNNING BROAD JUMP (1/2)
Trial 1_____
Trial 2_____ (23)_____

(4) BALANCES ON ONE FOOT 5 Sec. (1/2)
Trial 1_____
Trial 2_____ (24)_____

(4) WALKS BACKWARDS (1/2)
Trial 1_____
Trial 2_____ (25)_____

(3) SITTING FROM PRONE POSITION (1/2)
Trial 1_____
Trial 2_____ (26)_____

(3) HOPS ON 1 FOOT TWICE (1/2)
Trial 1_____
Trial 2_____ (27)_____

(3) BROAD JUMP (1/2)
Trial 1_____
Trial 2_____ (28)_____

(2) JUMPS IN PLACE (1/2)
Trial 1_____
Trial 2_____ (29)_____

(2) BALANCES ON ONE FOOT 1 Sec. (1/2)
Trial 1_____
Trial 2_____ (30)_____

VISUAL MOTOR INTERGRATION

(4) PICKS LONGER LINE (3/3)
Trial 1_____
Trial 2_____
Trial 3_____
Trial 4_____
Trial 5_____
Trial 6_____ (31)_____

(4) COPIES CROSS (32)_____

(4) IMITATES SQUARE DEMO (33)_____

(4) DRAWS MAN - 3 PARTS (34)_____

(3) IMITATES BRIDGE (35)_____

(3) COPIES CIRCLE (36)_____

(3) FORM BOARD (37)_____

(3) TOWER OF 6 BLOCKS (38)_____

(2) IMITATES STROKE (39)_____

(2) STRINGING BEADS (40)_____

LANGUAGE DEVELOPMENT

(4) OPPOSITE ANALOGIES (3/5)

Girl_____

Dark_____

Woman_____

Fast_____

Night_____ (41)_____

(4) PICTURE VOCABULARY (14/16)
(42)_____

(4) DEFINES WORDS (3/5)

Bed_____

Chair_____

Car_____

Cookie_____

Book_____ (43)_____

(4) TALKS ABOUT PICTURES (2/3)

_____

_____

_____

_____ (44)_____

(3) REPEATS TWELVE SYLLABLE SENTENCE (45)_____

(3) FOLLOWS DIRECTIONS (3/5)
(46)_____

(3) COMPREHENDS COLD, TIRED, HUNGRY (3/3)
(47)_____

(3) IDENTIFYING PICTURES

Running_____

Sleeping_____

Eating_____ (48)_____

(2) TELLS NAME (49)_____

(2) PICTURE VOCABULARY (50)_____

CONCEPT DEVELOPMENT

(4) LOOK ALIKES (3/5)
(51)_____

(4) COMPREHENSION (2/2)

Eyes_____

Ears_____ (52)_____

(4) KNOWS AGE (53)_____

(4) COMPREHENSION (2/2)

Thirsty_____

Stoves_____ (54)_____

(3) RECOGNIZES COLORS (3/4)

Red_____

Blue_____

Green_____

Yellow_____ (55)_____

(3) SORTING BUTTONS (56)_____

(3) COMPARISON OF BALLS (3/3)
(57)_____

(3) MATCHES THREE COLORS (3/4)
(58)_____

(2) TRAIN OF CUBES (59)_____

(2) DEFINES WORDS BY USE (60)_____

APPENDIX F

CONSENT FORM

APPENDIX F

CONSENT FORM

I give permission to _____ to test my child. I understand that the testing process includes working with my child in the following areas: coordination, concept development, language, and listening and visual skills.

I understand that all results can be shared with me and that no information gathered by the examiner will be released without my written consent. I understand that the results will be published in research format for a research project being completed at the University of Tennessee. A number will be used instead of my child's name to protect his identity.

I understand that I am free to withdraw my consent for testing at any time during or following the testing session.

_____ Signature

_____ Relationship to child

_____ Child's name

_____ Child's birth date

APPENDIX G

TABLE I

APPENDIX G

TABLE I

PILOT STUDY RESULTS

Item Number	Item	Percent Passing within Age Level of Test Item	Age Group[a]
1.	Match Like Objects	100	I
2.	Match Drawings	100	I
3.	Copies M & N	33	II
4.	Folds Paper	66	II
5.	Adds Parts to Man	25	III
6.	Six Piece Puzzle	0	III
7.	Matching Symbols	100	IV
8.	Recognize Letters	75	IV
9.	Names Objects from Memory	100	V
10.	Recalls Three Colors	75	V
11.	Repeats Words	100	I
12.	Repeats Two Digits	100	I
13.	Repeats Simple Sentence	100	II
14.	Repeats Three Digits	66	II
15.	Counts to Five	100	III
16.	Identifies Noise	100	III
17.	Repeats Sentence	75	IV
18.	Repeats Story	50	IV
19.	Follows Directions	75	V
20.	Tapping Sequence	100	V
21.	Balance on One Foot	100	I
22.	Hops on One Foot	0	I
23.	Jumps in Place	67	II
24.	Broad Jump	67	II
25.	Sitting from Prone Position	75	III
26.	Finger Touch	100	III
27.	Balance on One Foot—Five Seconds	75	IV
28.	Jumps at Least Two Inches	75	IV
29.	Heel-Toe-Walk	75	V
30.	Skips Using Alternative Feet	0	V
31.	Stringing Beads	100	I
32.	Tower of Six Blocks	100	I
33.	Imitates Crayon Stroke	100	II
34.	Dumps Raisin from Bottle	100	II
35.	Copies Circle	50	III
36.	Imitates Bridge	100	III

TABLE I (continued)

Item Number	Item	Percent Passing within Age Level of Test Item	Age Group[a]
37.	Imitates Square	50	IV
38.	Draws a Man—Three Parts	50	IV
39.	Copies Cross	75	V
40.	Picks Longer Line	75	V
41.	Names Common Picture	100	I
42.	Knows Name	0	I
43.	Touches Picture	100	II
44.	Comprehends Cold, Tired and Hungry	66	II
45.	Follows Directions	75	III
46.	Talks about Pictures	0	III
47.	Repeats Two Syllable Sentence	75	IV
48.	Defines Words in Terms of Use	100	IV
49.	Picture Vocabulary	100	V
50.	Opposite Analogies	75	V
51.	Identifies Objects	100	I
52.	Copies Train	0	I
53.	Matches Colors	66	II
54.	Comparison of Balls	66	II
55.	Recognizes Colors	25	III
56.	Sorts Buttons	100	III
57.	Comprehension	100	IV
58.	Knows Name	100	IV
59.	Concept Development	100	V
60.	Look-A-Likes	100	V

[a]Group I = 2—2-1/2 years
Group II = 2-1/2—3 years
Group III = 3—3-1/2 years
Group IV = 3-1/2—4 years
Group V = 4—4-1/2 years

APPENDIX H

TABLES II THROUGH IV

APPENDIX H

TABLE II

ANALYSIS OF ITEM DIFFICULTY FOR GROUPS I AND II AND RELATIONSHIP TO TOTAL SCORE

Item	Norming Sample: 2 Years, 6 Mos. to 3 Years — Percent Passing	Norming Sample: 2 Years, 6 Mos. to 3 Years — Point Biserial with Total	Norming Sample: 3 Years to 3 Years, 6 Mos. — Percent Passing	Norming Sample: 3 Years to 3 Years, 6 Mos. — Point Biserial with Total
Visual Memory				
1. Recall Three Colors	.071	-.088	.286	.414
2. Pictoral Memory	.214	.232	.500	.567
3. Recognizes Letters	.000	.000	.286	.366
4. Six Piece Puzzle	.071	.322	.429	.368
5. Matching Symbols	.571	.739	1.000	.000
6. Adds Parts to Man	.571	.216	.714	-.583
7. Copies M or N	.071	.210	.357	.647
8. Folds Paper	.571	.197	.929	.073
9. Identifying Parts	.929	-0.98	1.000	.000
10. Matches Like Objects	.929	.460	1.000	.000
Auditory Memory				
11. Tapping Sequence	.000	.000	.214	.342
12. Repeats Story	.000	.000	.286	.438
13. Follows Three Direct.	.071	.247	.500	.371
14. Repeat Sentence	.071	.322	.357	.465
15. Identify Noise	.429	.230	.929	.369
16. Counts to Five	.714	-.203	..929	.369
17. Repeats Three Digits	.929	.088	1.000	.000
18. Repeats Sentence	1.000	.000	1.000	.000

TABLE II (continued)

Item	Norming Sample: 2 Years, 6 Mos. to 3 Years — Percent Passing	2 Years, 6 Mos. to 3 Years — Point Biserial with Total	3 Years to 3 Years, 6 Mos. — Percent Passing	3 Years to 3 Years, 6 Mos. — Point Biserial with Total
Auditory Memory (continued)				
19. Repeats Two Digits	1.000	.000	1.000	.000
20. Repetition of Words	1.000	.000	.929	.115
Gross Motor Development				
21. Skips	.071	.098	.071	-.242
22. Heel Toe Walk	.143	.008	.214	.342
23. Running Broad Jump	.143	.227	.214	.156
24. Balances on One Foot	.429	.830	.429	.302
25. Walks Backwards	.500	.700	.786	.535
26. Sitting from Prone Position	.786	.469	1.000	.000
27. Hops One Foot Twice	.214	.045	.571	.557
28. Broad Jump	.786	.305	.929	.115
29. Jumps in Place	1.000	.000	1.000	.000
30. Balances on One Foot	1.000	.000	1.000	.000
Visual Motor Integration				
31. Picks Longer Line	.286	.203	.214	.607
32. Copies Cross	.429	.830	.643	.377
33. Imitates Square Demo.	.143	.254	.143	.579
34. Draws Man—3 Parts	.214	.606	.571	.755
35. Imitates Bridge	.786	.609	1.000	.000
36. Copies Circle	.643	.556	.714	.407
37. Form Board	.786	.539	1.000	.000
38. Tower of 6 Blocks	.929	.088	1.000	.000

TABLE II (continued)

Item	Norming Sample: 2 Years, 6 Mos. to 3 Years — Percent Passing	2 Years, 6 Mos. to 3 Years — Point Biserial with Total	3 Years to 3 Years, 6 Mos. — Percent Passing	3 Years to 3 Years, 6 Mos. — Point Biserial with Total
Visual Motor Integration (continued)				
39. Imitates Stroke	1.000	.000	1.000	.000
40. Stringing Beads	1.000	.000	1.000	.000
Language Development				
41. Opposite Analogies	.357	.304	.143	.142
42. Picture Vocabulary	.643	.476	.857	.450
43. Defines Words	.643	.816	.786	.642
44. Talks about Pictures	.214	.512	.500	.632
45. Repeats Twelve Syllable Sentence	.286	.649	.643	.491
46. Follows Directions	.857	.431	.857	.450
47. Comprehends Cold, Tired, Hungry	.500	.489	.643	.423
48. Identifying Pictures	.929	.497	.929	.242
49. Tells Name	.786	.025	.929	.242
50. Picture Vocabulary	1.000	.000	1.000	.000
Concept Development				
51. Look Alikes	.357	.484	.357	.357
52. Comprehension	.357	.344	.214	.687
53. Knows Age	.500	.623	.929	.073
54. Comprehension	.357	.504	.429	.655
55. Recognize Colors	.571	.429	.643	.514
56. Sorting Buttons	.643	.616	1.000	.000
57. Comparison of Balls	.500	.374	.786	.296

TABLE II (continued)

Item	Norming Sample: 2 Years, 6 Mos. to 3 Years — Percent Passing	2 Years, 6 Mos. to 3 Years — Point Biserial with Total	3 Years to 3 Years, 6 Mos. — Percent Passing	3 Years to 3 Years, 6 Mos. — Point Biserial with Total
Concept Development (continued)				
58. Matches Three Colors	.429	.385	.929	.073
59. Train of Cubes	.929	-.210	1.000	.000
60. Identifies Objects by Use	1.000	.000	1.000	.000

TABLE III

ANALYSIS OF ITEM DIFFICULTY FOR GROUPS III AND IV AND RELATIONSHIP TO TOTAL SCORE

Item	Norming Sample: 3 Years, 6 Mos. to 4 Years — Percent Passing	3 Years, 6 Mos. to 4 Years — Point Biserial with Total	4 Years to 4 Years, 6 Mos. — Percent Passing	4 Years to 4 Years, 6 Mos. — Point Biserial with Total
Visual Memory				
1. Recall Three Colors	.467	.575	.733	.405
2. Pictoral Memory	.667	-.181	1.000	.000
3. Recognizes Letters	.533	.751	.733	.457
4. Six Piece Puzzle	.467	.603	.800	.322
5. Matching Symbols	1.000	.000	1.000	.000
6. Adds Parts to Man	.733	.401	.933	.295
7. Copies M or N	.600	.529	.733	.301
8. Folds Paper	.933	.246	.867	.432
9. Identifying Parts	1.000	.000	.933	.478
10. Matches Like Objects	1.000	.000	.933	.478
Auditory Memory				
11. Tapping Sequence	.467	.170	.667	.195
12. Repeats Story	.400	.518	.800	.322
13. Follows Three Direct.	.800	.020	1.000	.000
14. Repeat Sentence	.267	.423	.600	-.131
15. Identify Noise	.800	.054	.800	.551
16. Counts to Five	.933	-.350	.867	.364
17. Repeats Three Digits	.933	.083	.933	.478
18. Repeats Sentence	1.000	.000	1.000	.000
19. Repeats Two Digits	1.000	.000	1.000	.000
20. Repetition of Words	1.000	.000	1.000	.000

TABLE III (continued)

Item	Norming Sample: 3 Years, 6 Mos. to 4 Years — Percent Passing	3 Years, 6 Mos. to 4 Years — Point Biserial with Total	4 Years to 4 Years, 6 Mos. — Percent Passing	4 Years to 4 Years, 6 Mos. — Point Biserial with Total
Gross Motor Development				
21. Skips	.200	.223	.400	.459
22. Heel Toe Walk	.267	.484	.867	.095
23. Running Broad Jump	.467	-.236	1.000	.000
24. Balances on One Foot	.667	.227	.800	-.081
25. Walks Backwards	.867	.400	.933	.111
26. Sitting from Prone Position	.867	-.514	1.000	.000
27. Hops One Foot Twice	.800	.358	.867	.162
28. Broad Jump	1.000	.000	1.000	.000
29. Jumps in Place	.933	.300	1.000	.000
30. Balances on One Foot	1.000	.000	1.000	.000
Visual Motor Integration				
31. Picks Longer Line	.600	.198	.933	-.258
32. Copies Cross	.733	.401	.933	.295
33. Imitates Square Demo.	.333	.239	.400	.553
34. Draws Man—3 Parts	.933	.246	1.000	.000
35. Imitates Bridge	1.000	.000	.933	-.442
36. Copies Circle	.933	.246	1.000	.000
37. Form Board	1.000	.000	1.000	.000
38. Tower of 6 Blocks	1.000	.000	1.000	.000
39. Imitates Stroke	1.000	.000	1.000	.000
40. Stringing Beads	1.000	.000	1.000	.000

TABLE III (continued)

Item	Norming Sample: 3 Years, 6 Mos. to 4 Years — Percent Passing	3 Years, 6 Mos. to 4 Years — Point Biserial with Total	4 Years to 4 Years, 6 Mos. — Percent Passing	4 Years to 4 Years, 6 Mos. — Point Biserial with Total
Language Development				
41. Opposite Analogies	.267	.668	.467	.212
42. Picture Vocabulary	.800	.122	.933	.018
43. Defines Words	.933	.300	1.000	.000
44. Talks about Pictures	.533	.642	.933	.478
45. Repeats Twelve Syllable Sentence	.867	.281	.933	.478
46. Follows Directions	1.000	.000	1.000	.000
47. Comprehends Cold, Tired, Hungry	.800	.156	1.000	.000
48. Identifying Pictures	1.000	.000	1.000	.000
49. Tells Name	.733	.310	.933	.018
50. Picture Vocabulary	.933	.246	1.000	.000
Concept Development				
51. Look Alikes	.800	.324	.933	.018
52. Comprehension	.400	.821	.800	.551
53. Knows Age	.800	.392	1.000	.000
54. Comprehension	.600	.419	.933	.478
55. Recognizes Colors	.667	.392	1.000	.000
56. Sorting Buttons	1.000	.000	1.000	.000
57. Comparison of Balls	.800	.189	.933	.018
58. Matches Three Colors	1.000	.000	1.000	.000
59. Train of Cubes	1.000	.000	1.000	.000
60. Identifies Objects by Use	1.000	.000	1.000	.000

TABLE IV

ANALYSIS OF ITEM DIFFICULTY FOR GROUPS V AND VI AND RELATIONSHIP TO TOTAL SCORE

Item	Norming Sample: 4 Years, 6 Mos. to 5 Years — Percent Passing	4 Years, 6 Mos. to 5 Years — Point Biserial with Total	5 Years to 5 Years, 6 Mos. — Percent Passing	5 Years to 5 Years, 6 Mos. — Point Biserial with Total
Visual Memory				
1. Recall Three Colors	.895	.071	.889	.158
2. Pictoral Memory	.895	.071	1.000	.000
3. Recognizes Letters	.789	.283	.889	.672
4. Six Piece Puzzle	.842	.056	.667	.790
5. Matching Symbols	1.000	.000	1.000	.000
6. Adds Parts to Man	.947	.318	1.000	.000
7. Copies M or N	.947	.221	.889	.672
8. Folds Paper	.895	.149	1.000	.000
9. Identifying Parts	1.000	.000	1.000	.000
10. Matches Like Objects	1.000	.000	1.000	.000
Auditory Memory				
11. Tapping Sequence	.895	-.243	.100	.000
12. Repeats Story	.737	.532	.778	.747
13. Follows Three Direct.	.789	.342	.889	.672
14. Repeat Sentence	.737	.587	.556	.875
15. Identify Noise	.895	.384	.667	.000
16. Counts to Five	1.000	.000	.100	.000
17. Repeats Three Digits	1.000	.000	.100	.000
18. Repeats Sentence	1.000	.000	.100	.000
19. Repeats Two Digits	1.000	.000	.100	.000
20. Repetition of Words	1.000	.000	.100	.000

TABLE IV (continued)

Item	Norming Sample: 4 Years, 6 Mos. to 5 Years — Percent Passing	4 Years, 6 Mos. to 5 Years — Point Biserial with Total	5 Years to 5 Years, 6 Mos. — Percent Passing	5 Years to 5 Years, 6 Mos. — Point Biserial with Total
Gross Motor Development				
21. Skips	.316	.379	.667	.790
22. Heel Toe Walk	.789	.519	1.000	.000
23. Running Broad Jump	.947	.318	1.000	.000
24. Balances on One Foot	.842	.386	.889	.197
25. Walks Backwards	.947	.211	1.000	.000
26. Sitting from Prone Position	.947	.103	.889	.316
27. Hops One Foot Twice	.947	.318	1.000	.000
28. Broad Jump	1.000	.000	1.000	.000
29. Jumps in Place	1.000	.000	1.000	.000
30. Balances on One Foot	1.000	.000	1.000	.000
Visual Motor Integration				
31. Picks Longer Line	.895	.228	.889	-.040
32. Copies Cross	1.000	.000	1.000	.000
33. Imitates Square Demo.	.737	.259	.889	.197
34. Draws Man—3 Parts	.947	.211	1.000	.000
35. Imitates Bridge	.842	.056	.889	.197
36. Copies Circle	.947	.103	1.000	.000
37. Form Board	1.000	.000	1.000	.000
38. Tower of 6 Blocks	1.000	.000	1.000	.000
39. Imitates Stroke	1.000	.000	1.000	.000
40. Stringing Beads	1.000	.000	1.000	.000

TABLE IV (continued)

Item	Norming Sample: 4 Years, 6 Mos. to 5 Years — Percent Passing	4 Years, 6 Mos. to 5 Years — Point Biserial with Total	5 Years to 5 Years, 6 Mos. — Percent Passing	5 Years to 5 Years, 6 Mos. — Point Biserial with Total
Language Development				
41. Opposite Analogies	.947	.103	1.000	.000
42. Picture Vocabulary	.947	.103	1.000	.000
43. Defines Words	1.000	.000	1.000	.000
44. Talks about Pictures	.947	.103	.556	.425
45. Repeats Twelve Syllable Sentence	.895	.384	1.000	.000
46. Follows Directions	1.000	.000	1.000	.000
47. Comprehends Cold, Tired, Hungry	.947	.211	1.000	.000
48. Identifying Pictures	1.000	.000	1.000	.000
49. Tells Name	1.000	.000	1.000	.000
50. Picture Vocabulary	1.000	.000	1.000	.000
Concept Development				
51. Look Alikes	1.000	.000	1.000	.000
52. Comprehension	1.000	.000	.889	.672
53. Knows Age	.947	-.112	1.000	.000
54. Comprehension	1.000	.000	1.000	.000
55. Recognizes Colors	1.000	.000	.889	.000
56. Sorting Buttons	1.000	.000	1.000	.672
57. Comparison of Balls	.947	.211	1.000	.000
58. Matches Three Colors	1.000	.000	1.000	.000
59. Train of Cubes	1.000	.000	1.000	.000
60. Identifies Objects by Use	1.000	.000	1.000	.000

APPENDIX I

TABLES V THROUGH IX

APPENDIX I

TABLE V

PERCENTAGE OF GROUP I CHILDREN PASSING GROUP I ITEMS

Item		Percentage Passing
9.	Identifying Parts	.929
10.	Matching Like Objects	.929
19.	Repeats Two Digits	1.000
20.	Repetition of Words	1.000
29.	Jumps in Place	1.000
30.	Balance on One Foot	1.000
39.	Imitates Stroke	1.000
40.	Stringing Beads	1.000
49.	Tells Name	.786
50.	Picture Vocabulary	1.000
59.	Train of Cubes	.929
60.	Identifies Objects by Use	1.000

TABLE VI

PERCENTAGE OF GROUP II CHILDREN PASSING GROUP II ITEMS

Item		Percentage Passing
7.	Copies M or N	.357
8.	Folds Paper	.929
17.	Repeats Three Digits	1.000
18.	Repeats Sentence	1.000
27.	Hops on One Foot Twice	.571
28.	Broad Jump	.929
37.	Form Board	1.000
38.	Tower of 6 Blocks	1.000
47.	Comprehends Cold, Tired, Hungry	.643
48.	Identifying Pictures	.929
57.	Comparison of Balls	.786
58.	Matches Three Colors	.929

TABLE VII

PERCENTAGE OF GROUP III CHILDREN PASSING GROUP III ITEMS

	Item	Percentage Passing
5.	Matching Symbols	1.000
6.	Adds Parts to Man	.733
15.	Identifies Noise	.800
16.	Counts to Five	.933
25.	Walks Backwards	.867
26.	Sitting from Prone Position	.867
35.	Imitates Bridge	1.000
36.	Copies Circle	.933
45.	Repeats Twelve Syllable Sentence	.867
46.	Follows Directions	1.000
55.	Recognizes Colors	.667
56.	Sorting Buttons	1.000

TABLE VIII

PERCENTAGE OF GROUP IV CHILDREN PASSING GROUP IV ITEMS

	Item	Percentage Passing
3.	Recognizes Letters	.733
4.	Six Piece Puzzle	.800
13.	Follows Three Directions	1.000
14.	Repeat Sentence	.600
23.	Running Broad Jump	1.000
24.	Balances on One Foot	.800
33.	Imitates Square Demonstrated	.400
34.	Draws Man—3 Parts	1.000
43.	Defines Words	1.000
44.	Talks about Pictures	.933
53.	Knows Age	1.000
54.	Comprehension	.933

TABLE IX

PERCENTAGE OF GROUP V CHILDREN PASSING GROUP V ITEMS

Item		Percentage Passing
1.	Recall Three Colors	.895
2.	Pictoral Memory	.895
11.	Tapping Sequence	.895
12.	Repeats Story	.737
21.	Skips	.316
22.	Heel Toe Walk	.789
31.	Picks Longer Line	.895
32.	Copies Cross	1.000
41.	Opposite Analogies	.947
42.	Picture Vocabulary	.860
51.	Look Alikes	1.000
52.	Comprehension	1.000

APPENDIX J

TABLES X THROUGH XII

APPENDIX J

TABLE X

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUPS I AND II, AND RACE

	Item	Group I Percentage Passing		Group II Percentage Passing	
		Black	White	Black	White
1.	Recall Three Colors	*	7.1	100.0	25.0
2.	Pictoral Memory	*	21.4	100.0	50.0
3.	Recognizes Letters	*	100.0	0.0	33.3
4.	Six Piece Puzzle	*	7.1	0.0	58.3
5.	Matching Symbols	*	57.1	100.0	100.0
6.	Adds Parts to Man	*	57.1	100.0	66.7
7.	Copies M or N	*	7.1	0.0	41.7
8.	Folds Paper	*	57.1	100.0	91.7
9.	Identifying Parts	*	92.9	100.0	100.0
10.	Matches Like Objects	*	92.9	100.0	100.0
11.	Tapping Sequence	*	100.0	100.0	16.7
12.	Repeats Story	*	100.0	100.0	25.0
13.	Follows Three Directions	*	7.1	100.0	41.7
14.	Repeat Sentence	*	7.1	0.0	41.7
15.	Identify Noise	*	50.0	100.0	91.7
16.	Counts to Five	*	71.4	100.0	91.7
17.	Repeats Three Digits	*	92.9	100.0	100.0
18.	Repeats Sentence	*	100.0	100.0	100.0
19.	Repeats Two Digits	*	100.0	100.0	100.0
20.	Repetition of Words	*	100.0	100.0	100.0
21.	Skips	*	7.1	0.0	8.3
22.	Heel Toe Walk	*	14.3	0.0	25.0
23.	Running Broad Jump	*	14.3	0.0	25.0
24.	Balances on One Foot	*	42.9	100.0	41.7

TABLE X (continued)

	Item	Group I Percentage Passing Black	Group I Percentage Passing White	Group II Percentage Passing Black	Group II Percentage Passing White
25.	Walks Backwards	*	57.1	100.0	75.0
26.	Sitting from Prone Position	*	78.6	100.0	100.0
27.	Hops One Foot Twice	*	21.4	100.0	58.3
28.	Broad Jump	*	78.6	100.0	100.0
29.	Jumps in Place	*	100.0	100.0	100.0
30.	Balances on One Foot	*	100.0	100.0	100.0
31.	Picks Longer Line	*	28.6	100.0	16.7
32.	Copies Cross	*	64.3	100.0	75.0
33.	Imitates Square Demo.	*	14.3	0.0	16.7
34.	Draws Man—3 Parts	*	21.4	100.0	58.3
35.	Imitates Bridge	*	85.7	100.0	100.0
36.	Copies Circle	*	64.3	100.0	75.0
37.	Form Board	*	78.6	100.0	100.0
38.	Tower of 6 Blocks	*	92.9	100.0	100.0
39.	Imitates Stroke	*	100.0	100.0	100.0
40.	Stringing Beads	*	100.0	100.0	100.0
41.	Opposite Analogies	*	35.7	0.0	16.7
42.	Picture Vocabulary	*	64.3	100.0	83.3
43.	Defines Words	*	71.4	100.0	75.0
44.	Talks about Pictures	*	21.4	100.0	58.3
45.	Repeats Twelve Syllable Sentence	*	28.6	100.0	58.3
46.	Follows Directions	*	85.7	100.0	83.3
47.	Comprehends Cold, Tired, Hungry	*	50.0	100.0	58.3
48.	Identifying Pictures	*	92.9	100.0	91.7
49.	Tells Name	*	78.6	100.0	100.0
50.	Picture Vocabulary	*	100.0	100.0	100.0
51.	Look Alikes	*	35.7	0.0	41.7

TABLE X (continued)

Item	Group I Percentage Passing		Group II Percentage Passing	
	Black	White	Black	White
52. Comprehension	*	35.7	0.0	25.0
53. Knows Age	*	50.0	100.0	91.7
54. Comprehension	*	35.7	100.0	41.7
55. Recognizes Colors	*	57.1	100.0	75.0
56. Sorting Buttons	*	64.3	100.0	100.0
57. Comparison of Balls	*	50.0	100.0	75.0
58. Matches Three Colors	*	50.0	100.0	91.7
59. Train of Cubes	*	92.9	100.0	100.0
60. Identifies Objects by Use	*	100.0	100.0	100.0

*No Blacks in this group.

TABLE XI

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUPS III AND IV, AND RACE

Item	Group III Percentage Passing		Group IV Percentage Passing	
	Black	White	Black	White
1. Recall Three Colors	66.7	41.7	50.0	76.9
2. Pictoral Memory	66.7	66.7	100.0	100.0
3. Recognizes Letters	66.7	50.0	50.0	76.9
4. Six Piece Puzzle	33.3	50.0	50.0	84.6
5. Matching Symbols	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	66.7	100.0	92.3
7. Copies M or N	66.7	58.3	100.0	76.9
8. Folds Paper	100.0	91.7	100.0	92.3
9. Identifying Parts	100.0	100.0	100.0	92.3
10. Matches Like Objects	100.0	100.0	100.0	92.3
11. Tapping Sequence	66.7	41.7	100.0	61.5
12. Repeats Story	66.7	33.3	50.0	84.6
13. Follows Three Directions	100.0	100.0	100.0	100.0
14. Repeat Sentence	33.3	25.0	50.0	61.5
15. Identify Noise	33.3	91.7	100.0	76.9
16. Counts to Five	100.0	91.7	100.0	84.6
17. Repeats Three Digits	100.0	91.7	50.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0
21. Skips	33.3	16.7	50.0	38.5
22. Heel Toe Walk	33.3	25.0	50.0	92.3
23. Running Broad Jump	100.0	50.0	100.0	100.0
24. Balances on One Foot	100.0	58.3	100.0	76.9
25. Walks Backwards	100.0	83.3	100.0	92.3
26. Sitting from Prone Position	66.7	91.7	100.0	100.0

TABLE XI (continued)

Item	Group III Percentage Passing		Group IV Percentage Passing	
	Black	White	Black	White
27. Hops One Foot Twice	100.0	75.0	100.0	84.6
28. Broad Jump	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	91.7	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0
31. Picks Longer Line	66.7	58.3	100.0	92.3
32. Copies Cross	100.0	66.7	100.0	92.3
33. Imitates Square Demo.	33.3	33.3	0.0	46.2
34. Draws Man—3 Parts	100.0	91.7	100.0	100.0
35. Imitates Bridge	100.0	100.0	100.0	92.3
36. Copies Circle	100.0	91.7	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0
41. Opposite Analogies	0.0	41.7	50.0	46.2
42. Picture Vocabulary	66.7	83.3	50.0	100.0
43. Defines Words	100.0	91.7	100.0	100.0
44. Talks about Pictures	66.7	50.0	100.0	92.3
45. Repeats Twelve Syllable Sentence	100.0	83.3	50.0	100.0
46. Follows Directions	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	66.7	83.3	100.0	100.0
48. Identifying Pictures	100.0	100.0	100.0	100.0
49. Tells Name	66.7	75.0	50.0	100.0
50. Picture Vocabulary	100.0	91.7	100.0	100.0
51. Look Alikes	66.7	83.3	50.0	100.0
52. Comprehension	33.3	41.7	50.0	84.6

TABLE XI (continued)

Item	Group III Percentage Passing		Group IV Percentage Passing	
	Black	White	Black	White
53. Knows Age	66.7	83.3	100.0	100.0
54. Comprehension	66.7	58.3	50.0	100.0
55. Recognizes Colors	66.7	66.7	100.0	100.0
56. Sorting Buttons	100.0	100.0	100.0	100.0
57. Comparison of Balls	100.0	75.0	100.0	92.3
58. Matches Three Colors	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0

TABLE XII

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUPS V AND VI, AND RACE

Item	Group V Percentage Passing		Group VI Percentage Passing	
	Black	White	Black	White
1. Recall Three Colors	100.0	86.7	100.0	85.7
2. Pictoral Memory	13.3	86.7	100.0	100.0
3. Recognizes Letters	50.0	80.0	100.0	85.7
4. Six Piece Puzzle	100.0	80.0	0.0	85.7
5. Matching Symbols	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	93.3	100.0	100.0
7. Copies M or N	100.0	100.0	100.0	85.7
8. Folds Paper	100.0	86.7	100.0	100.0
9. Identifying Parts	100.0	100.0	100.0	100.0
10. Matches Like Objects	100.0	100.0	100.0	100.0
11. Tapping Sequence	100.0	86.7	100.0	100.0
12. Repeats Story	50.0	80.0	50.0	71.4
13. Follows Three Directions	100.0	73.3	100.0	85.7
14. Repeat Sentence	50.0	80.0	0.0	71.4
15. Identify Noise	100.0	86.7	100.0	57.1
16. Counts to Five	100.0	100.0	100.0	100.0
17. Repeats Three Digits	100.0	100.0	100.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0
21. Skips	50.0	33.3	50.0	71.4
22. Heel Toe Walk	0.0	93.3*	100.0	100.0
23. Running Broad Jump	100.0	93.3	100.0	100.0
24. Balances on One Foot	100.0	86.7	100.0	85.7
25. Walks Backwards	100.0	93.3	100.0	100.0
26. Sitting from Prone Position	100.0	93.3	50.0	100.0

TABLE XII (continued)

Item	Group V Percentage Passing		Group VI Percentage Passing	
	Black	White	Black	White
27. Hops One Foot Twice	100.0	100.0	100.0	100.0
28. Broad Jump	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0
31. Picks Longer Line	100.0	86.7	100.0	85.7
32. Copies Cross	100.0	100.0	100.0	100.0
33. Imitates Square Demo.	50.0	80.0	50.0	100.0
34. Draws Man—3 Parts	100.0	93.3	100.0	100.0
35. Imitates Bridge	100.0	80.0	50.0	100.0
36. Copies Circle	100.0	93.3	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0
41. Opposite Analogies	50.0	100.0	100.0	100.0
42. Picture Vocabulary	50.0	100.0	100.0	100.0
43. Defines Words	100.0	100.0	100.0	100.0
44. Talks about Pictures	100.0	93.3	0.0	71.4
45. Repeats Twelve Syllable Sentence	100.0	86.7	100.0	100.0
46. Follows Directions	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	50.0	100.0	100.0	100.0
48. Identifying Pictures	100.0	100.0	100.0	100.0
49. Tells Name	100.0	100.0	100.0	100.0
50. Picture Vocabulary	100.0	100.0	100.0	100.0
51. Look Alikes	100.0	100.0	100.0	100.0
52. Comprehension	100.0	100.0	100.0	85.7

TABLE XII (continued)

Item	Group V Percentage Passing		Group VI Percentage Passing	
	Black	White	Black	White
53. Knows Age	100.0	93.3	100.0	100.0
54. Comprehension	100.0	100.0	100.0	100.0
55. Recognizes Colors	100.0	100.0	100.0	85.7
56. Sorting Buttons	100.0	100.0	100.0	100.0
57. Comparison of Balls	50.0	100.0	100.0	100.0
58. Matches Three Colors	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0

*Significantly different at .01 level.

APPENDIX K

TABLES XIII THROUGH XV

APPENDIX K

TABLE XIII

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUPS I AND II, AND SEX

Item	Group I Percentage Passing		Group II Percentage Passing	
	Male	Female	Male	Female
1. Recall Three Colors	12.5	0.0	0.0	37.5
2. Pictoral Memory	37.5	0.0	60.0	50.0
3. Recognizes Letters	100.0	100.0	0.0	37.5
4. Six Piece Puzzle	12.5	0.0	40.0	62.5
5. Matching Symbols	50.0	66.7	100.0	100.0
6. Adds Parts to Man	50.0	66.7	80.0	62.5
7. Copies M or N	12.5	0.0	20.0	50.0
8. Folds Paper	62.5	50.0	100.0	100.0
9. Identifying Parts	87.5	100.0	100.0	100.0
10. Matches Like Objects	100.0	83.3	100.0	100.0
11. Tapping Sequence	100.0	100.0	0.0	37.5
12. Repeats Story	100.0	100.0	0.0	50.0
13. Follows Three Directions	12.5	0.0	40.0	62.5
14. Repeat Sentence	12.5	0.0	40.0	37.5
15. Identify Noise	50.0	50.0	100.0	87.5
16. Counts to Five	62.5	83.3	100.0	87.5
17. Repeats Three Digits	87.5	100.0	100.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0
21. Skips	12.5	0.0	20.0	0.0
22. Heel Toe Walk	25.0	0.0	20.0	25.0
23. Running Broad Jump	25.0	0.0	20.0	25.0
24. Balances on One Foot	50.0	33.3	40.0	50.0

TABLE XIII (continued)

Item	Group I Percentage Passing		Group II Percentage Passing	
	Male	Female	Male	Female
25. Walks Backwards	50.0	66.7	80.0	75.0
26. Sitting from Prone Position	75.0	83.3	100.0	100.0
27. Hops One Foot Twice	12.5	33.3	20.0	75.0
28. Broad Jump	62.5	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0
31. Picks Longer Line	37.5	16.7	20.0	25.0
32. Copies Cross	50.0	33.3	60.0	75.0
33. Imitates Square Demo.	12.5	16.7	0.0	25.0
34. Draws Man—3 Parts	12.5	33.3	40.0	75.0
35. Imitates Bridge	87.5	83.3	100.0	100.0
36. Copies Circle	50.0	83.3	60.0	75.0
37. Form Board	75.0	83.3	100.0	100.0
38. Tower of 6 Blocks	87.5	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0
41. Opposite Analogies	50.0	16.7	20.0	0.0
42. Picture Vocabulary	75.0	50.0	80.0	87.0
43. Defines Words	75.0	50.0	60.0	87.5
44. Talks about Pictures	12.5	33.3	40.0	75.0
45. Repeats Twelve Syllable Sentence	25.0	33.3	60.0	75.0
46. Follows Directions	75.0	100.0	80.0	87.5
47. Comprehends Cold, Tired, Hungry	50.0	50.0	80.0	50.0
48. Identifying Pictures	87.5	100.0	80.0	100.0
49. Tells Name	62.5	100.0	80.0	100.0
50. Picture Vocabulary	100.0	100.0	100.0	100.0
51. Look Alikes	50.0	16.7	40.0	37.5

TABLE XIII (continued)

Item	Group I Percentage Passing		Group II Percentage Passing	
	Male	Female	Male	Female
52. Comprehension	37.5	33.3	20.0	25.0
53. Knows Age	62.5	33.3	100.0	87.5
54. Comprehension	37.5	33.3	20.0	50.0
55. Recognizes Colors	62.5	50.0	40.0	87.5
56. Sorting Buttons	50.0	83.3	100.0	100.0
57. Comparison of Balls	50.0	50.0	60.0	87.5
58. Matches Three Colors	50.0	50.0	100.0	87.5
59. Train of Cubes	87.5	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0

TABLE XIV

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUPS III AND IV, AND SEX

Item	Group III Percentage Passing		Group IV Percentage Passing	
	Male	Female	Male	Female
1. Recall Three Colors	16.7	66.7	72.5	75.0
2. Pictoral Memory	83.3	55.6	100.0	100.0
3. Recognizes Letters	33.3	66.7	81.8	50.0
4. Six Piece Puzzle	16.7	66.7	81.8	75.0
5. Matching Symbols	100.0	100.0	100.0	100.0
6. Adds Parts to Man	50.0	88.9	90.9	100.0
7. Copies M or N	50.0	66.7	81.8	75.0
8. Folds Paper	83.3	100.0	100.0	75.0
9. Identifying Parts	100.0	100.0	90.9	100.0
10. Matches Like Objects	100.0	100.0	90.0	100.0
11. Tapping Sequence	33.3	55.6	72.7	50.0
12. Repeats Story	50.0	33.3	90.9	50.0
13. Follows Three Directions	83.3	77.8	100.0	100.0
14. Repeat Sentence	16.7	33.3	63.6	50.0
15. Identify Noise	83.3	77.8	81.8	75.0
16. Counts to Five	100.0	88.9	81.8	100.0
17. Repeats Three Digits	100.0	88.9	100.0	75.0
18. Repeats Sentence	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0
21. Skips	16.7	22.2	45.5	25.0
22. Heel Toe Walk	0.0	44.4	81.8	100.0
23. Running Broad Jump	66.7	33.3	100.0	100.0
24. Balances on One Foot	50.0	77.8	72.7	100.0
25. Walks Backwards	66.7	100.0	90.9	100.0
26. Sitting from Prone Position	100.0	77.8	100.0	100.0

TABLE XIV (continued)

Item	Group III Percentage Passing		Group IV Percentage Passing	
	Male	Female	Male	Female
27. Hops One Foot Twice	66.7	88.9	90.9	75.0
28. Broad Jump	100.0	100.0	100.0	100.0
29. Jumps in Place	83.3	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0
31. Picks Longer Line	50.0	66.7	100.0	75.0
32. Copies Cross	83.3	66.7	90.9	100.0
33. Imitates Square Demo.	33.3	33.3	36.4	50.0
34. Draws Man—3 Parts	83.3	100.0	100.0	100.0
35. Imitates Bridge	100.0	100.0	90.9	100.0
36. Copies Circle	83.3	100.0	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0
41. Opposite Analogies	0.0	55.6*	54.5	25.0
42. Picture Vocabulary	83.3	77.8	90.0	100.0
43. Defines Words	83.3	100.0	100.0	100.0
44. Talks about Pictures	33.3	66.7	90.9	100.0
45. Repeats Twelve Syllable Sentence	83.3	88.9	100.0	75.0
46. Follows Directions	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	100.0	66.7	100.0	100.0
48. Identifying Pictures	100.0	100.0	100.0	100.0
49. Tells Name	66.7	77.8	90.9	100.0
50. Picture Vocabulary	83.3	100.0	100.0	100.0
51. Look Alikes	66.7	88.9	90.0	100.0
52. Comprehension	50.0	100.0	100.0	100.0

TABLE XIV (continued)

Item	Group III Percentage Passing		Group IV Percentage Passing	
	Male	Female	Male	Female
53. Knows Age	50.0	100.0	100.0	100.0
54. Comprehension	50.0	66.7	100.0	75.0
55. Recognizes Colors	50.0	77.8	100.0	100.0
56. Sorting Buttons	100.0	100.0	100.0	100.0
57. Comparison of Balls	66.7	88.9	90.9	100.0
58. Matches Three Colors	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0

TABLE XV

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUPS V AND VI, AND SEX

	Item	Group V Percentage Passing		Group VI Percentage Passing	
		Male	Female	Male	Female
1.	Recall Three Colors	87.5	90.0	100.0	85.7
2.	Pictoral Memory	87.5	90.0	100.0	100.0
3.	Recognizes Letters	62.5	90.0	100.0	85.7
4.	Six Piece Puzzle	98.5	80.0	50.0	71.4
5.	Matching Symbols	50.0	71.4	100.0	100.0
6.	Adds Parts to Man	100.0	100.0	100.0	100.0
7.	Copies M or N	100.0	90.0	100.0	85.7
8.	Folds Paper	75.0	100.0	100.0	100.0
9.	Identifying Parts	100.0	100.0	100.0	100.0
10.	Matches Like Objects	100.0	100.0	100.0	100.0
11.	Tapping Sequence	87.5	90.0	100.0	100.0
12.	Repeats Story	62.5	90.0	50.0	85.7
13.	Follows Three Directions	75.0	80.0	100.0	85.7
14.	Repeat Sentence	62.5	90.0	0.0	71.4
15.	Identify Noise	75.0	100.0	50.0	71.4
16.	Counts to Five	100.0	100.0	100.0	100.0
17.	Repeats Three Digits	100.0	100.0	100.0	100.0
18.	Repeats Sentence	100.0	100.0	100.0	100.0
19.	Repeats Two Digits	100.0	100.0	100.0	100.0
20.	Repetition of Words	100.0	100.0	100.0	100.0
21.	Skips	25.0	40.0	0.0	85.7
22.	Heel Toe Walk	87.5	80.0	100.0	100.0
23.	Running Broad Jump	100.0	90.0	100.0	100.0
24.	Balances on One Foot	75.0	100.0	50.0	100.0
25.	Walks Backwards	87.5	100.0	100.0	100.0
26.	Sitting from Prone Position	87.5	100.0	50.0	100.0

TABLE XV (continued)

Item		Group V Percentage Passing		Group VI Percentage Passing	
		Male	Female	Male	Female
27.	Hops One Foot Twice	100.0	100.0	100.0	100.0
28.	Broad Jump	100.0	100.0	100.0	100.0
29.	Jumps in Place	100.0	100.0	100.0	100.0
30.	Balances on One Foot	100.0	100.0	100.0	100.0
31.	Picks Longer Line	87.5	90.0	100.0	85.7
32.	Copies Cross	100.0	100.0	100.0	100.0
33.	Imitates Square Demo.	62.5	90.0	100.0	85.7
34.	Draws Man—3 Parts	87.5	100.0	100.0	100.0
35.	Imitates Bridge	87.5	80.0	100.0	85.7
36.	Copies Circle	87.5	100.0	100.0	100.0
37.	Form Board	100.0	100.0	100.0	100.0
38.	Tower of 6 Blocks	100.0	100.0	100.0	100.0
39.	Imitates Stroke	100.0	100.0	100.0	100.0
40.	Stringing Beads	100.0	100.0	100.0	100.0
41.	Opposite Analogies	87.5	100.0	100.0	100.0
42.	Picture Vocabulary	87.5	100.0	100.0	100.0
43.	Defines Words	100.0	100.0	100.0	100.0
44.	Talks about Pictures	100.0	90.0	0.0	71.4
45.	Repeats Twelve Syllable Sentence	87.5	90.0	100.0	100.0
46.	Follows Directions	100.0	100.0	100.0	100.0
47.	Comprehends Cold, Tired, Hungry	100.0	90.0	100.0	100.0
48.	Identifying Pictures	100.0	100.0	100.0	100.0
49.	Tells Name	100.0	100.0	100.0	100.0
50.	Picture Vocabulary	100.0	100.0	100.0	100.0
51.	Look Alikes	100.0	100.0	100.0	100.0
52.	Comprehension	100.0	100.0	100.0	85.7

TABLE XV (continued)

Item	Group V Percentage Passing		Group VI Percentage Passing	
	Male	Female	Male	Female
53. Knows Age	87.5	100.0	100.0	100.0
54. Comprehension	100.0	100.0	100.0	100.0
55. Recognizes Colors	100.0	100.0	100.0	85.7
56. Sorting Buttons	100.0	100.0	100.0	100.0
57. Comparison of Balls	100.0	90.0	100.0	100.0
58. Matches Three Colors	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0

APPENDIX L

TABLES XVI THROUGH XXI

APPENDIX L

TABLE XVI

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP I AND FATHER'S OCCUPATION

Item	Group I Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	0.0	50.0	0.0	0.0	*
2. Pictoral Memory	20.0	100.0	0.0	0.0	*
3. Recognizes Letters	100.0	100.0	100.0	100.0	*
4. Six Piece Puzzle	0.0	0.0	0.0	20.0	*
5. Matching Symbols	60.0	100.0	0.0	60.0	*
6. Adds Parts to Man	60.0	100.0	0.0	60.0	*
7. Copies M or N	20.0	0.0	0.0	0.0	*
8. Folds Paper	80.0	50.0	50.0	40.0	*
9. Identifying Parts	100.0	100.0	100.0	80.0	*
10. Matches Like Objects	100.0	100.0	50.0	100.0	*
11. Tapping Sequence	100.0	100.0	100.0	100.0	*
12. Repeats Story	100.0	100.0	100.0	100.0	*
13. Follows Three Directions	0.0	50.0	0.0	0.0	*
14. Repeat Sentence	0.0	0.0	0.0	20.0	*
15. Identify Noise	20.0	100.0	50.0	60.0	*
16. Counts to Five	100.0	50.0	100.0	40.0	*
17. Repeats Three Digits	100.0	50.0	100.0	100.0	*
18. Repeats Sentence	100.0	100.0	100.0	100.0	*
19. Repeats Two Digits	100.0	100.0	100.0	100.0	*
20. Repetition of Words	100.0	100.0	100.0	100.0	*
21. Skips	0.0	0.0	0.0	20.0	*
22. Heel Toe Walk	0.0	0.0	0.0	40.0	*
23. Running Broad Jump	20.0	0.0	0.0	20.0	*
24. Balances on One Foot	40.0	50.0	0.0	60.0	*

TABLE XVI (continued)

	Item	Group I Percentage Passing 1	2	3	4	5
25.	Walks Backwards	60.0	50.0	0.0	80.0	*
26.	Sitting from Prone Position	80.0	50.0	50.0	100.0	*
27.	Hops One Foot Twice	20.0	0.0	0.0	40.0	*
28.	Broad Jump	100.0	50.0	50.0	80.0	*
29.	Jumps in Place	100.0	100.0	100.0	100.0	*
30.	Balances on One Foot	100.0	100.0	100.0	100.0	*
31.	Picks Longer Line	40.0	50.0	0.0	20.0	*
32.	Copies Cross	40.0	50.0	0.0	60.0	*
33.	Imitates Square Demo.	0.0	50.0	0.0	20.0	*
34.	Draws Man—3 Parts	20.0	50.0	0.0	20.0	*
35.	Imitates Bridge	80.0	100.0	50.0	100.0	*
36.	Copies Circle	60.0	50.0	0.0	100.0	*
37.	Form Board	80.0	100.0	50.0	80.0	*
38.	Tower of 6 Blocks	100.0	50.0	100.0	100.0	*
39.	Imitates Stroke	100.0	100.0	100.0	100.0	*
40.	Stringing Beads	100.0	100.0	100.0	100.0	*
41.	Opposite Analogies	20.0	50.0	0.0	60.0	*
42.	Picture Vocabulary	80.0	100.0	0.0	60.0	*
43.	Defines Words	80.0	100.0	0.0	80.0	*
44.	Talks about Pictures	20.0	0.0	0.0	40.0	*
45.	Repeats Twelve Syllable Sentence	20.0	0.0	0.0	60.0	*
46.	Follows Directions	100.0	50.0	50.0	100.0	*
47.	Comprehends Cold, Tired, Hungry	80.0	50.0	0.0	40.0	*
48.	Identifying Pictures	100.0	100.0	50.0	100.0	*
49.	Tells Name	80.0	50.0	50.0	100.0	*
50.	Picture Vocabulary	100.0	100.0	100.0	100.0	*
51.	Look Alikes	20.0	50.0	0.0	60.0	*

TABLE XVI (continued)

Item	Group I Percentage Passing				
	1	2	3	4	5
52. Comprehension	20.0	50.0	0.0	60.0	*
53. Knows Age	20.0	100.0	0.0	80.0	*
54. Comprehension	40.0	0.0	0.0	60.0	*
55. Recognizes Colors	60.0	50.0	50.0	60.0	*
56. Sorting Buttons	80.0	100.0	0.0	60.0	*
57. Comparison of Balls	80.0	50.0	0.0	80.0	*
58. Matches Three Colors	40.0	50.0	0.0	80.0	*
59. Train of Cubes	80.0	100.0	100.0	100.0	*
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	*

*No children in this occupational category.

TABLE XVII

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP II AND FATHER'S OCCUPATION

Item	Group II Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	66.7	0.0	33.3	20.0	0.0
2. Pictoral Memory	66.7	0.0	66.7	40.0	50.0
3. Recognizes Letters	100.0	0.0	0.0	20.0	0.0
4. Six Piece Puzzle	66.7	100.0	33.3	40.0	50.0
5. Matching Symbols	100.0	100.0	100.0	100.0	100.0
6. Adds Parts to Man	33.3	100.0	33.3	100.0	100.0
7. Copies M or N	66.7	100.0	66.7	0.0	0.0
8. Folds Paper	66.7	100.0	100.0	100.0	100.0
9. Identifying Parts	100.0	100.0	100.0	100.0	100.0
10. Matches Like Objects	100.0	100.0	100.0	100.0	100.0
11. Tapping Sequence	33.3	0.0	0.0	40.0	0.0
12. Repeats Story	66.7	0.0	0.0	40.0	0.0
13. Follows Three Directions	66.7	0.0	66.7	40.0	50.0
14. Repeat Sentence	66.7	100.0	33.3	20.0	0.0
15. Identify Noise	100.0	100.0	100.0	80.0	100.0
16. Counts to Five	100.0	100.0	100.0	80.0	100.0
17. Repeats Three Digits	100.0	100.0	100.0	100.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0	100.0
21. Skips	0.0	0.0	0.0	20.0	0.0
22. Heel Toe Walk	33.3	0.0	33.3	0.0	50.0
23. Running Broad Jump	33.3	0.0	33.3	20.0	0.0
24. Balances on One Foot	0.0	100.0	66.7	40.0	50.0
25. Walks Backwards	100.0	100.0	66.7	60.0	100.0
26. Sitting from Prone Position	100.0	100.0	100.0	100.0	100.0

TABLE XVII (continued)

Item	Group II Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	100.0	100.0	66.7	40.0	0.0
28. Broad Jump	100.0	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0	100.0
31. Picks Longer Line	33.3	0.0	0.0	20.0	50.0
32. Copies Cross	66.7	100.0	66.7	40.0	100.0
33. Imitates Square Demo.	33.3	100.0	0.0	0.0	0.0
34. Draws Man—3 Parts	66.7	100.0	100.0	20.0	50.0
35. Imitates Bridge	100.0	100.0	100.0	100.0	100.0
36. Copies Circle	100.0	100.0	66.7	60.0	50.0
37. Form Board	100.0	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0	100.0
41. Opposite Analogies	33.3	0.0	33.3	0.0	0.0
42. Picture Vocabulary	100.0	100.0	100.0	60.0	100.0
43. Defines Words	100.0	100.0	100.0	40.0	100.0
44. Talks about Pictures	33.3	100.0	100.0	40.0	50.0
45. Repeats Twelve Syllable Sentence	66.7	100.0	66.7	60.0	50.0
46. Follows Directions	100.0	100.0	100.0	60.0	100.0
47. Comprehends Cold, Tired, Hungry	66.7	100.0	66.7	40.0	100.0
48. Identifying Pictures	100.0	100.0	100.0	80.0	100.0
49. Tells Name	100.0	100.0	100.0	100.0	50.0
50. Picture Vocabulary	100.0	100.0	100.0	100.0	100.0
51. Look Alikes	33.3	100.0	66.7	20.0	0.0
52. Comprehension	66.7	0.0	33.3	0.0	0.0

TABLE XVII (continued)

Item	Group II Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.00	100.0	66.7	100.0	100.0
54. Comprehension	100.0	0.0	66.7	20.0	0.0
55. Recognizes Colors	100.0	100.0	66.7	80.0	0.0
56. Sorting Buttons	100.0	100.0	100.0	100.0	100.0
57. Comparison of Balls	100.0	0.0	100.0	60.0	100.0
58. Matches Three Colors	100.0	100.0	66.7	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	100.0

TABLE XVIII

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP III AND FATHER'S OCCUPATION

Item	Group III Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	33.3	0.0	75.0	50.0	0.0
2. Pictoral Memory	33.3	0.0	75.0	83.3	100.0
3. Recognizes Letters	100.0	100.0	25.0	50.0	0.0
4. Six Piece Puzzle	100.0	0.0	25.0	50.0	0.0
5. Matching Symbols	100.0	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	0.0	75.0	83.3	0.0
7. Copies M or N	66.7	100.0	25.0	66.7	100.0
8. Folds Paper	100.0	100.0	75.0	100.0	100.0
9. Identifying Parts	100.0	100.0	100.0	100.0	100.0
10. Matches Like Objects	100.0	100.0	100.0	100.0	100.0
11. Tapping Sequence	66.7	0.0	25.0	66.7	0.0
12. Repeats Story	33.3	100.0	50.0	33.3	0.0
13. Follows Three Directions	66.7	100.0	100.0	83.3	0.0
14. Repeat Sentence	33.3	100.0	25.0	16.7	0.0
15. Identify Noise	66.7	100.0	75.0	83.3	100.0
16. Counts to Five	100.0	100.0	100.0	83.3	100.0
17. Repeats Three Digits	66.7	100.0	100.0	100.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0	100.0
21. Skips	33.3	0.0	25.0	16.7	0.0
22. Heel Toe Walk	66.7	0.0	25.0	16.7	0.0
23. Running Broad Jump	33.3	100.0	75.0	16.7	100.0
24. Balances on One Foot	66.7	100.0	50.0	66.7	100.0
25. Walks Backwards	100.0	100.0	75.0	83.3	100.0
26. Sitting from Prone Position	100.0	100.0	75.0	83.3	100.0

TABLE XVIII (continued)

Item	Group III Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	66.7	100.0	75.0	83.3	100.0
28. Broad Jump	100.0	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	83.3	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0	100.0
31. Picks Longer Line	66.7	0.0	50.0	83.5	0.0
32. Copies Cross	66.7	100.0	100.0	50.0	100.0
33. Imitates Square Demo.	33.3	100.0	25.0	33.3	0.0
34. Draws Man—3 Parts	100.0	100.0	75.0	100.0	100.0
35. Imitates Bridge	100.0	100.0	100.0	100.0	100.0
36. Copies Circle	100.0	100.0	75.0	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0	100.0
41. Opposite Analogies	66.7	0.0	0.0	50.0	0.0
42. Picture Vocabulary	100.0	0.0	75.0	83.3	100.0
43. Defines Words	100.0	100.0	100.0	83.3	100.0
44. Talks about Pictures	66.7	100.0	50.0	33.3	100.0
45. Repeats Twelve Syllable Sentence	66.7	100.0	100.0	83.3	100.0
46. Follows Directions	100.0	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	66.7	100.0	75.0	83.3	100.0
48. Identifying Pictures	100.0	100.0	100.0	100.0	100.0
49. Tells Name	66.7	100.0	100.0	66.7	0.0
50. Picture Vocabulary	100.0	100.0	75.0	100.0	100.0
51. Look Alikes	100.0	100.0	100.0	66.7	0.0
52. Comprehension	66.7	100.0	25.0	33.3	0.0

TABLE XVIII (continued)

Item	Group III Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	100.0	100.0	66.7	0.0
54. Comprehension	66.7	0.0	50.0	66.7	100.0
55. Recognizes Colors	100.0	0.0	50.0	83.3	0.0
56. Sorting Buttons	100.0	100.0	100.0	100.0	100.0
57. Comparison of Balls*	66.7	0.0	100.0	100.0	0.0
58. Matches Three Colors	100.0	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	100.0

*Significantly different at .05 level.

TABLE XIX

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP IV AND FATHER'S OCCUPATION

Item	Group IV Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	100.0	100.0	100.0	66.7	0.0
2. Pictoral Memory	100.0	100.0	100.0	100.0	100.0
3. Recognizes Letters	100.0	100.0	50.0	77.8	0.0
4. Six Piece Puzzle	50.0	100.0	100.0	88.9	0.0
5. Matching Symbols	100.0	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	100.0	100.0	88.9	100.0
7. Copies M or N	50.0	100.0	50.0	88.9	100.0
8. Folds Paper	100.0	100.0	100.0	88.9	100.0
9. Identifying Parts	100.0	100.0	100.0	88.9	100.0
10. Matches Like Objects	100.0	100.0	100.0	88.9	100.0
11. Tapping Sequence	100.0	100.0	50.0	55.6	100.0
12. Repeats Story	100.0	100.0	100.0	77.8	0.0
13. Follows Three Directions	100.0	100.0	100.0	100.0	100.0
14. Repeat Sentence	50.0	0.0	100.0	55.6	100.0
15. Identify Noise	100.0	100.0	50.0	77.8	100.0
16. Counts to Five	100.0	100.0	50.0	88.9	100.0
17. Repeats Three Digits*	100.0	100.0	100.0	100.0	0.0
18. Repeats Sentence	100.0	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0	100.0
21. Skips	0.0	0.0	0.0	66.7	0.0
22. Heel Toe Walk	50.0	100.0	100.0	88.9	100.0
23. Running Broad Jump	100.0	100.0	100.0	100.0	100.0
24. Balances on One Foot	50.0	0.0	50.0	100.0	100.0
25. Walks Backwards	50.0	100.0	100.0	100.0	100.0
26. Sitting from Prone Position	100.0	100.0	100.0	100.0	100.0

TABLE XIX (continued)

Item	Group IV Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	50.0	100.0	100.0	88.9	100.0
28. Broad Jump	100.0	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0	100.0
31. Picks Longer Line	50.0	100.0	100.0	100.0	100.0
32. Copies Cross	100.0	100.0	100.0	88.9	100.0
33. Imitates Square Demo.	100.0	100.0	50.0	22.2	0.0
34. Draws Man—3 Parts	100.0	100.0	100.0	100.0	100.0
35. Imitates Bridge	100.0	100.0	100.0	88.9	100.0
36. Copies Circle	100.0	100.0	100.0	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0	100.0
41. Opposite Analogies	100.0	100.0	0.0	44.4	0.0
42. Picture Vocabulary	100.0	100.0	100.0	88.9	100.0
43. Defines Words	100.0	100.0	100.0	100.0	100.0
44. Talks about Pictures	100.0	100.0	100.0	88.9	100.0
45. Repeats Twelve Syllable Sentence*	100.0	100.0	100.0	100.0	0.0
46. Follows Directions	100.0	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	100.0	100.0	100.0	100.0	100.0
48. Identifying Pictures	100.0	100.0	100.0	100.0	100.0
49. Tells Name	100.0	100.0	100.0	88.9	100.0
50. Picture Vocabulary	100.0	100.0	100.0	100.0	100.0
51. Look Alikes	100.0	100.0	100.0	88.9	100.0
52. Comprehension	100.0	100.0	50.0	88.9	0.0

TABLE XIX (continued)

Item	Group IV Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	100.0	100.0	100.0	100.0
54. Comprehension	100.0	100.0	100.0	100.0	0.0*
55. Recognizes Colors	100.0	100.0	100.0	100.0	100.0
56. Sorting Buttons	100.0	100.0	100.0	100.0	100.0
57. Comparison of Balls	100.0	100.0	50.0	100.0	100.0
58. Matches Three Colors	100.0	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	100.0

*Significantly different at .05 level.

TABLE XX

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP V AND FATHER'S OCCUPATION

Item	Group V Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	100.0	100.0	100.0	81.8	100.0
2. Pictoral Memory	100.0	100.0	100.0	81.8	100.0
3. Recognizes Letters	100.0	100.0	100.0	81.8	0.0
4. Six Piece Puzzle	50.0	100.0	100.0	81.8	100.0
5. Matching Symbols	100.0	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	100.0	0.0	100.0	100.0
7. Copies M or N	50.0	100.0	100.0	100.0	100.0
8. Folds Paper	100.0	50.0	100.0	100.0	50.0
9. Identifying Parts	100.0	100.0	100.0	100.0	100.0
10. Matches Like Objects	100.0	100.0	100.0	100.0	100.0
11. Tapping Sequence	100.0	100.0	100.0	81.8	100.0
12. Repeats Story	100.0	100.0	100.0	63.6	100.0
13. Follows Three Directions	100.0	100.0	0.0	72.7	100.0
14. Repeat Sentence	50.0	100.0	100.0	90.9	0.0
15. Identify Noise	100.0	100.0	100.0	81.8	100.0
16. Counts to Five	100.0	100.0	100.0	100.0	100.0
17. Repeats Three Digits	100.0	100.0	100.0	100.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0	100.0
21. Skips	0.0	0.0	0.0	54.5	0.0
22. Heel Toe Walk	100.0	100.0	0.0	90.0	50.0
23. Running Broad Jump	100.0	100.0	0.0	100.0	100.0
24. Balances on One Foot	100.0	100.0	100.0	81.8	100.0
25. Walks Backwards	50.0	100.0	100.0	100.0	100.0
26. Sitting from Prone Position	100.0	50.0	100.0	100.0	100.0

TABLE XX (continued)

Item	Group V Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	100.0	100.0	100.0	100.0	100.0
28. Broad Jump	100.0	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0	100.0
31. Picks Longer Line	100.0	100.0	0.0	90.9	100.0
32. Copies Cross	100.0	100.0	100.0	100.0	100.0
33. Imitates Square Demo.	50.0	100.0	100.0	81.8	50.0
34. Draws Man—3 Parts	100.0	100.0	100.0	90.9	100.0
35. Imitates Bridge	100.0	50.0	100.0	81.8	100.0
36. Copies Circle	100.0	100.0	100.0	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0	100.0
41. Opposite Analogies	100.0	100.0	100.0	90.9	100.0
42. Picture Vocabulary	100.0	100.0	100.0	90.9	100.0
43. Defines Words	100.0	100.0	100.0	100.0	100.0
44. Talks about Pictures	100.0	100.0	100.0	90.9	100.0
45. Repeats Twelve Syllable Sentence	50.0	100.0	0.0	100.0	100.0
46. Follows Directions	100.0	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	100.0	100.0	100.0	100.0	50.0
48. Identifying Pictures	100.0	100.0	100.0	100.0	100.0
49. Tells Name	100.0	100.0	100.0	100.0	100.0
50. Picture Vocabulary	100.0	100.0	100.0	100.0	100.0
51. Look Alikes	100.0	100.0	100.0	100.0	100.0
52. Comprehension	100.0	100.0	100.0	100.0	100.0

TABLE XX (continued)

Item	Group V Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	100.0	100.0	90.9	100.0
54. Comprehension	100.0	100.0	100.0	100.0	100.0
55. Recognizes Colors	100.0	100.0	100.0	100.0	100.0
56. Sorting Buttons	100.0	100.0	100.0	100.0	100.0
57. Comparison of Balls	100.0	100.0	100.0	100.0	50.0
58. Matches Three Colors	100.0	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	100.0

TABLE XXI

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP VI AND FATHER'S OCCUPATION

Item	Group VI Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	100.0	75.0	*	100.0	100.0
2. Pictoral Memory	100.0	100.0	*	100.0	100.0
3. Recognizes Letters	100.0	100.0	*	0.0	100.0
4. Six Piece Puzzle	100.0	100.0	*	0.0	0.0
5. Matching Symbols	100.0	100.0	*	100.0	100.0
6. Adds Parts to Man	100.0	100.0	*	100.0	100.0
7. Copies M or N	100.0	100.0	*	0.0	100.0
8. Folds Paper	100.0	100.0	*	100.0	100.0
9. Identifying Parts	100.0	100.0	*	100.0	100.0
10. Matches Like Objects	100.0	100.0	*	100.0	100.0
11. Tapping Sequence	100.0	100.0	*	100.0	100.0
12. Repeats Story	100.0	100.0	*	0.0	50.0
13. Follows Three Directions	100.0	100.0	*	0.0	100.0
14. Repeat Sentence	100.0	75.0	*	0.0	0.0
15. Identify Noise	100.0	25.0	*	100.0	100.0
16. Counts to Five	100.0	100.0	*	100.0	100.0
17. Repeats Three Digits	100.0	100.0	*	100.0	100.0
18. Repeats Sentence	100.0	100.0	*	100.0	100.0
19. Repeats Two Digits	100.0	100.0	*	100.0	100.0
20. Repetition of Words	100.0	100.0	*	100.0	100.0
21. Skips	100.0	75.0	*	0.0	50.0
22. Heel Toe Walk	100.0	100.0	*	100.0	100.0
23. Running Broad Jump	100.0	100.0	*	100.0	100.0
24. Balances on One Foot	100.0	75.0	*	100.0	100.0
25. Walks Backwards	100.0	100.0	*	100.0	100.0
26. Sitting from Prone Position	100.0	100.0	*	100.0	50.0

TABLE XXI (continued)

Item	Group VI Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	100.0	100.0	*	100.0	100.0
28. Broad Jump	100.0	100.0	*	100.0	100.0
29. Jumps in Place	100.0	100.0	*	100.0	100.0
30. Balances on One Foot	100.0	100.0	*	100.0	100.0
31. Picks Longer Line	100.0	75.0	*	100.0	100.0
32. Copies Cross	100.0	100.0	*	100.0	100.0
33. Imitates Square Demo.	100.0	100.0	*	100.0	50.0
34. Draws Man—3 Parts	100.0	100.0	*	100.0	100.0
35. Imitates Bridge	100.0	100.0	*	100.0	50.0
36. Copies Circle	100.0	100.0	*	100.0	100.0
37. Form Board	100.0	100.0	*	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	*	100.0	100.0
39. Imitates Stroke	100.0	100.0	*	100.0	100.0
40. Stringing Beads	100.0	100.0	*	100.0	100.0
41. Opposite Analogies	100.0	100.0	*	100.0	100.0
42. Picture Vocabulary	100.0	100.0	*	100.0	100.0
43. Defines Words	100.0	100.0	*	100.0	100.0
44. Talks about Pictures	100.0	50.0	*	100.0	0.0
45. Repeats Twelve Syllable Sentence	100.0	100.0	*	100.0	100.0
46. Follows Directions	100.0	100.0	*	100.0	100.0
47. Comprehends Cold, Tired, Hungry	100.0	100.0	*	100.0	100.0
48. Identifying Pictures	100.0	100.0	*	100.0	100.0
49. Tells Name	100.0	100.0	*	100.0	100.0
50. Picture Vocabulary	100.0	100.0	*	100.0	100.0
51. Look Alikes	100.0	100.0	*	100.0	100.0
52. Comprehension**	100.0	100.0	*	0.0	100.0

TABLE XXI (continued)

Item	Group VI Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	100.0	*	100.0	100.0
54. Comprehension	100.0	100.0	*	100.0	100.0
55. Recognizes Colors**	100.0	100.0	*	0.0	100.0
56. Sorting Buttons	100.0	100.0	*	100.0	100.0
57. Comparison of Balls	100.0	100.0	*	100.0	100.0
58. Matches Three Colors	100.0	100.0	*	100.0	100.0
59. Train of Cubes	100.0	100.0	*	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	*	100.0	100.0

*No children in this occupational category.

**Significantly different at .05 level.

APPENDIX M

TABLES XII THROUGH XXVII

APPENDIX M

TABLE XXII

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP I AND MOTHER'S OCCUPATION

Item	Group I Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	0.0	14.3	*	0.0	0.0
2. Pictoral Memory	50.0	28.6	*	0.0	0.0
3. Recognizes Letters	100.0	100.0	*	100.0	100.0
4. Six Piece Puzzle	0.0	0.0	*	0.0	100.0
5. Matching Symbols	50.0	57.1	*	50.0	100.0
6. Adds Parts to Man	50.0	57.1	*	50.0	100.0
7. Copies M or N	50.0	0.0	*	0.0	0.0
8. Folds Paper	50.0	71.4	*	25.0	100.0
9. Identifying Parts	100.0	100.0	*	75.0	100.0
10. Matches Like Objects	100.0	85.7	*	100.0	100.0
11. Tapping Sequence	100.0	100.0	*	100.0	100.0
12. Repeats Story	100.0	100.0	*	100.0	100.0
13. Follows Three Directions	0.0	14.3	*	0.0	0.0
14. Repeat Sentence**	0.0	0.0	*	0.0	100.0
15. Identify Noise	0.0	57.1	*	50.1	100.0
16. Counts to Five	100.0	85.0	*	25.0	100.0
17. Repeats Three Digits	100.0	85.7	*	100.0	100.0
18. Repeats Sentence	100.0	100.0	*	100.0	100.0
19. Repeats Two Digits	100.0	100.0	*	100.0	100.0
20. Repetition of Words	100.0	100.0	*	100.0	100.0
21. Skips	0.0	0.0	*	25.0	0.0
22. Heel Toe Walk	0.0	0.0	*	50.0	0.0
23. Running Broad Jump	50.0	0.0	*	25.0	0.0
24. Balances on One Foot	50.0	28.6	*	50.0	100.0

TABLE XXII (continued)

Item	Group I Percentage Passing				
	1	2	3	4	5
25. Walks Backwards	50.0	42.9	*	75.0	100.0
26. Sitting from Prone Position	100.0	57.1	*	100.0	100.0
27. Hops One Foot Twice	50.0	0.0	*	25.0	100.0
28. Broad Jump	100.0	71.4	*	75.0	100.0
29. Jumps in Place	100.0	100.0	*	100.0	100.0
30. Balances on One Foot	100.0	100.0	*	100.0	100.0
31. Picks Longer Line	50.0	28.6	*	25.0	0.0
32. Copies Cross	50.0	28.6	*	50.0	100.0
33. Imitates Square Demo.	0.0	14.3	*	25.0	0.0
34. Draws Man—3 Parts	0.0	28.6	*	25.0	0.0
35. Imitates Bridge	50.0	85.7	*	100.0	100.0
36. Copies Circle	50.0	42.9	*	100.0	100.0
37. Form Board	50.0	85.7	*	75.0	100.0
38. Tower of 6 Blocks	100.0	85.7	*	100.0	100.0
39. Imitates Stroke	100.0	100.0	*	100.0	100.0
40. Stringing Beads	100.0	100.0	*	100.0	100.0
41. Opposite Analogies	50.0	14.3	*	75.0	0.0
42. Picture Vocabulary	50.0	71.4	*	75.0	0.0
43. Defines Words	50.0	71.4	*	75.0	100.0
44. Talks about Pictaues	0.0	14.3	*	50.0	0.0
45. Repeats Twelve Syllable Sentence	0.0	14.3	*	50.0	100.0
46. Follows Directions	100.0	71.4	*	100.0	100.0
47. Comprehends Cold, Tired, Hungry	50.0	57.1	*	25.0	100.0
48. Identifying Pictures	100.0	85.7	*	100.0	100.0
49. Tells Name	50.0	71.4	*	100.0	100.0
50. Picture Vocabulary	100.0	100.0	*	100.0	100.0
51. Look Alikes	50.0	14.3	*	75.0	0.0

TABLE XXII (continued)

Item	Group I Percentage Passing				
	1	2	3	4	5
52. Comprehension	0.0	28.6	*	75.0	0.0
53. Knows Age	0.0	42.9	*	75.0	100.0
54. Comprehension	50.0	14.3	*	75.0	0.0
55. Recognizes Colors	50.0	57.1	*	50.0	100.0
56. Sorting Buttons	50.0	57.1	*	50.0	100.0
57. Comparison of Balls	100.0	42.9	*	25.0	100.0
58. Matches Three Colors	0.0	42.9	*	75.0	100.0
59. Train of Cubes	50.0	100.0	*	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	*	100.0	100.0

*No children in this occupational category.

**Significantly different at .05 level.

TABLE XXIII

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP II AND MOTHER'S OCCUPATION

Item	Group II Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	0.0	50.0	0.0	33.3	0.0
2. Pictoral Memory	0.0	75.0	100.0	33.3	100.0
3. Recognizes Letters	0.0	75.0	0.0	16.7	0.0
4. Six Piece Puzzle	100.0	75.0	0.0	33.3	100.0
5. Matching Symbols	100.0	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	50.0	0.0	83.3	100.0
7. Copies M or N	100.0	50.0	100.0	16.7	0.0
8. Folds Paper	100.0	75.0	100.0	100.0	100.0
9. Identifying Parts	100.0	100.0	100.0	100.0	100.0
10. Matches Like Objects	100.0	100.0	100.0	100.0	100.0
11. Tapping Sequence	0.0	25.0	0.0	33.3	0.0
12. Repeats Story	0.0	50.0	0.0	33.3	0.0
13. Follows Three Directions	0.0	50.0	100.0	50.0	0.0
14. Repeat Sentence	100.0	50.0	100.0	16.7	0.0
15. Identify Noise	100.0	100.0	100.0	83.3	100.0
16. Counts to Five	100.0	100.0	100.0	83.3	100.0
17. Repeats Three Digits	100.0	100.0	100.0	100.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0	100.0
21. Skips	0.0	25.0	0.0	0.0	0.0
22. Heel Toe Aalk	0.0	25.0	0.0	16.7	100.0
23. Running Broad Jump	0.0	50.0	0.0	16.7	0.0
24. Balances on One Foot	100.0	0.0	100.0	50.0	100.0
25. Walks Backwards	100.0	100.0	100.0	60.0	100.0
26. Sitting from Prone Position	100.0	100.0	100.0	100.0	100.0

TABLE XXIII (continued)

Item	Group II Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	100.0	75.0	100.0	50.0	0.0
28. Broad Jump	100.0	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0	100.0
31. Picks Longer Line	0.0	.25	0.0	16.7	100.0
32. Copies Cross	100.0	.75	0.0	50.0	100.0
33. Imitates Square Demo.	100.0	.25	0.0	0.0	0.0
34. Draws Man—3 Parts	100.0	.50	100.0	50.0	100.0
35. Imitates Bridge	100.0	100.0	100.0	100.0	100.0
36. Copies Circle	100.0	.75	100.0	66.7	100.0
37. Form Board	100.0	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0	100.0
41. Opposite Analogies	0.0	25.0	100.0	0.0	0.0
42. Picture Vocabulary	100.0	75.0	100.0	83.3	100.0
43. Defines Words	100.0	75.0	100.0	66.7	100.0
44. Talks about Pictures	100.0	25.0	100.0	66.7	100.0
45. Repeats Twelve Syllable Sentence	100.0	75.0	100.0	50.0	0.0
46. Follows Directions	100.0	75.0	100.0	83.3	100.0
47. Comprehends Cold, Tired, Hungry	100.0	75.0	100.0	33.3	100.0
48. Identifying Pictures	100.0	75.0	100.0	100.0	100.0
49. Tells Name	100.0	100.0	100.0	100.0	100.0
50. Picture Vocabulary	100.0	100.0	100.0	100.0	100.0
51. Look Alikes	100.0	50.0	100.0	16.7	0.0
52. Comprehension	0.0	50.0	100.0	16.7	0.0

TABLE XXIII (continued)

Item	Group II Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	100.0	100.0	83.3	100.0
54. Comprehension	0.0	75.0	100.0	33.3	0.0
55. Recognizes Colors	100.0	100.0	100.0	66.7	0.0
56. Sorting Buttons	100.0	100.0	100.0	100.0	100.0
57. Comparison of Balls	0.0	75.0	100.0	83.3	100.0
58. Matches Three Colors	100.0	100.0	100.0	83.3	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	100.0

TABLE XXIV

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP III AND MOTHER'S OCCUPATION

Item	Group III Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	50.0	100.0	50.0	28.6	50.0
2. Pictoral Memory	50.0	100.0	0.0	71.4	100.0
3. Recognizes Letters	100.0	50.0	50.0	57.1	0.0
4. Six Piece Puzzle	100.0	50.0	50.0	42.9	0.0
5. Matching Symbols	100.0	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	100.0	100.0	71.4	0.0
7. Copies M or N	100.0	50.0	0.0	57.1	100.0
8. Folds Paper	100.0	50.0	100.0	100.0	100.0
9. Identifying Parts	100.0	100.0	100.0	100.0	100.0
10. Matches Like Objects	100.0	100.0	100.0	100.0	100.0
11. Tapping Sequence	50.0	0.0	100.0	42.9	50.0
12. Repeats Story	50.0	50.0	0.0	57.1	0.0
13. Follows Three Directions	50.0	100.0	100.0	85.7	50.0
14. Repeat Sentence	50.0	50.0	0.0	28.6	0.0
15. Identify Noise*	100.0	100.0	0.0	85.7	100.0
16. Counts to Five	100.0	100.0	100.0	85.7	100.0
17. Repeats Three Digits	50.0	100.0	100.0	100.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0	100.0
21. Skips*	0.0	0.0	100.0	14.3	0.0
22. Heel Toe Walk	50.0	0.0	100.0	14.3	0.0
23. Running Broad Jump	0.0	50.0	100.0	42.9	50.0
24. Balances on One Foot	50.0	50.0	100.0	57.1	100.0
25. Walks Backwards	100.0	100.0	100.0	74.4	100.0
26. Sitting from Prone Position	100.0	50.0	100.0	85.7	100.0

TABLE XXIV (continued)

Item	Group III Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	100.0	100.0	50.0	71.4	100.0
28. Broad Jump	100.0	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	85.7	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0	100.0
31. Picks Longer Line	100.0	50.0	50.0	57.1	50.0
32. Copies Cross	100.0	100.0	50.0	71.4	50.0
33. Imitates Square Demo.	50.0	50.0	0.0	28.6	50.0
34. Draws Man—3 Parts	100.0	100.0	100.0	85.7	100.0
35. Imitates Bridge	100.0	100.0	100.0	100.0	100.0
36. Copies Circle	100.0	50.0	100.0	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0	100.0
41. Opposite Analogies	100.0	0.0	0.0	28.6	50.0
42. Picture Vocabulary	100.0	100.0	50.0	85.7	50.0
43. Defines Words	100.0	100.0	100.0	85.7	100.0
44. Talks about Pictures	50.0	50.0	100.0	42.9	50.0
45. Repeats Twelve Syllable Sentence	50.0	100.0	100.0	85.7	100.0
46. Follows Directions	100.0	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	100.0	100.0	0.0	100.0	50.0
48. Identifying Pictures	100.0	100.0	100.0	100.0	100.0
49. Tells Name	100.0	100.0	50.0	85.7	0.0
50. Picture Vocabulary	100.0	50.0	100.0	100.0	100.0
51. Look Alikes	100.0	100.0	100.0	71.4	50.0
52. Comprehension	50.0	50.0	50.0	42.9	0.0

TABLE XXIV (continued)

Item	Group III Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	100.0	100.0	71.4	50.0
54. Comprehension	50.0	50.0	50.0	71.4	50.0
55. Recognizes Colors	100.0	50.0	50.0	85.7	0.0
56. Sorting Buttons	100.0	100.0	100.0	100.0	100.0
57. Comparison of Balls	100.0	100.0	50.0	85.7	50.0
58. Matches Three Colors	100.0	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	100.0

*Significantly different at .05 level.

TABLE XXV

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP IV AND MOTHER'S OCCUPATION

Item	Group IV Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	100.0	100.0	100.0	62.5	50.0
2. Pictoral Memory	100.0	100.0	100.0	100.0	100.0
3. Recognizes Letters	100.0	100.0	50.0	75.0	50.0
4. Six Piece Puzzle	50.0	100.0	100.0	87.5	50.0
5. Matching Symbols	1-0.0	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	100.0	100.0	87.5	50.0
7. Copies M or N	50.0	100.0	50.0	87.5	100.0
8. Folds Paper	100.0	100.0	100.0	87.5	100.0
9. Identifying Parts	100.0	100.0	100.0	100.0	100.0
10. Matches Like Objects	100.0	100.0	100.0	87.5	100.0
11. Tapping Sequence	100.0	100.0	50.0	50.0	100.0
12. Repeats Story	100.0	100.0	100.0	75.0	50.0
13. Follows Three Directions	100.0	100.0	100.0	100.0	100.0
14. Repeat Sentence	50.0	100.0	50.0	62.5	50.0
15. Identify Noise	100.0	100.0	50.0	75.0	50.0
16. Counts to Five	100.0	0.0	100.0	87.5	100.0
17. Repeats Three Digits	100.0	100.0	100.0	100.0	50.0
18. Repeats Sentence	100.0	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0	100.0
21. Skips	0.0	0.0	0.0	62.5	0.0
22. Heel Toe Walk	50.0	100.0	100.0	100.0	50.0
23. Running Broad Jump	100.0	100.0	100.0	100.0	100.0
24. Balances on One Foot*	0.0	0.0	100.0	100.0	100.0
25. Walks Backwards	50.0	100.0	100.0	100.0	100.0
26. Sitting from Prone Position	100.0	100.0	100.0	100.0	100.0

TABLE XXV (continued)

Item	Group IV Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	50.0	100.0	100.0	87.5	100.0
28. Broad Jump	100.0	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0	100.0
31. Picks Longer Line	100.0	100.0	50.0	100.0	100.0
32. Copies Cross	100.0	100.0	100.0	87.5	100.0
33. Imitates Square Demo.	100.0	0.0	100.0	25.0	0.0
34. Draws Man—3 Parts	100.0	100.0	100.0	100.0	100.0
35. Imitates Bridge	100.0	100.0	100.0	87.5	100.0
36. Copies Circle	100.0	100.0	100.0	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0	100.0
41. Opposite Analogies	100.0	0.0	50.0	37.5	50.0
42. Picture Vocabulary	100.0	100.0	100.0	100.0	50.0
43. Defines Words	100.0	100.0	100.0	100.0	100.0
44. Talks about Pictures	100.0	100.0	100.0	87.5	100.0
45. Repeats Twelve Syllable Sentence	100.0	100.0	100.0	100.0	50.0
46. Follows Directions	100.0	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	100.0	100.0	100.0	100.0	100.0
48. Identifying Pictures	100.0	100.0	100.0	100.0	100.0
49. Tells Name	100.0	100.0	100.0	100.0	50.0
50. Picture Vocabulary	100.0	100.0	100.0	100.0	100.0
51. Look Alikes	100.0	100.0	100.0	100.0	50.0
52. Comprehension	100.0	100.0	50.0	87.5	50.0

TABLE XXV (continued)

Item	Group IV Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	100.0	100.0	100.0	100.0
54. Comprehension	100.0	100.0	100.0	100.0	50.0
55. Recognizes Colors	100.0	100.0	100.0	100.0	100.0
56. Sorting Buttons	100.0	100.0	100.0	100.0	100.0
57. Comparison of Balls	100.0	0.0	100.0	100.0	100.0
58. Matches Three Colors	100.0	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	100.0

*Significantly different at .05 level.

TABLE XXVI

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP V AND MOTHER'S OCCUPATION

Item	Group V Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	100.0	66.7	*	90.9	100.0
2. Pictoral Memory	100.0	100.0	*	81.8	100.0
3. Recognizes Letters	100.0	100.0	*	72.7	0.0
4. Six Piece Puzzle	66.7	100.0	*	81.8	100.0
5. Matching Symbols	100.0	100.0	*	100.0	100.0
6. Adds Parts to Man	66.7	100.0	*	100.0	100.0
7. Copies M or N	66.7	100.0	*	100.0	100.0
8. Folds Paper	100.0	100.0	*	81.8	100.0
9. Identifying Parts	100.0	100.0	*	100.0	100.0
10. Matches Like Objects	100.0	100.0	*	100.0	100.0
11. Tapping Sequence	100.0	66.7	*	90.9	100.0
12. Repeats Story	100.0	100.0	*	63.6	100.0
13. Follows Three Directions	66.7	66.7	*	81.8	100.0
14. Repeat Sentence	66.7	100.0	*	81.8	0.0
15. Identify Noise	100.0	100.0	*	81.8	100.0
16. Counts to Five	100.0	100.0	*	100.0	100.0
17. Repeats Three Digits	100.0	100.0	*	100.0	100.0
18. Repeats Sentence	100.0	100.0	*	100.0	100.0
19. Repeats Two Digits	100.0	100.0	*	100.0	100.0
20. Repetition of Words	100.0	100.0	*	100.0	100.0
21. Skips	0.0	33.3	*	45.5	0.0
22. Heel Toe Walk	66.7	100.0	*	90.9	0.0
23. Running Broad Jump	66.7	100.0	*	100.0	100.0
24. Balances on One Foot	100.0	100.0	*	81.8	100.0
25. Walks Backwards	66.7	100.0	*	100.0	100.0
26. Sitting from Prone Position	100.0	100.0	*	90.9	100.0

TABLE XXVI (continued)

Item	Group V Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	100.0	100.0	*	100.0	100.0
28. Broad Jump	100.0	100.0	*	100.0	100.0
29. Jumps in Place	100.0	100.0	*	100.0	100.0
30. Balances on One Foot	100.0	100.0	*	100.0	100.0
31. Picks Longer Line	66.7	100.0	*	90.0	100.0
32. Copies Cross	100.0	100.0	*	100.0	100.0
33. Imitates Square Demo.	66.7	100.0	*	72.7	100.0
34. Draws Man—3 Parts	100.0	100.0	*	90.9	100.0
35. Imitates Bridge	100.0	66.7	*	81.8	100.0
36. Copies Circle	100.0	100.0	*	90.0	100.0
37. Form Board	100.0	100.0	*	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	*	100.0	100.0
39. Imitates Stroke	100.0	100.0	*	100.0	100.0
40. Stringing Beads	100.0	100.0	*	100.0	100.0
41. Opposite Analogies	100.0	100.0	*	90.9	100.0
42. Picture Vocabulary	100.0	100.0	*	90.9	100.0
43. Defines Words	100.0	100.0	*	100.0	100.0
44. Talks about Pictures	100.0	100.0	*	90.9	100.0
45. Repeats Twelve Syllable Sentence	33.3	100.0	*	100.0	100.0
46. Follows Directions	100.0	100.0	*	100.0	100.0
47. Comprehends Cold, Tired, Hungry	100.0	100.0	*	100.0	0.0
48. Identifying Pictures	100.0	100.0	*	100.0	100.0
49. Tells Name	100.0	100.0	*	100.0	100.0
50. Picture Vocabulary	100.0	100.0	*	100.0	100.0
51. Look Alikes	100.0	100.0	*	100.0	100.0
52. Comprehension	100.0	100.0	*	100.0	100.0

TABLE XXVI (continued)

Item	Group V Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	66.7	*	100.0	100.0
54. Comprehension	100.0	100.0	*	100.0	100.0
55. Recognizes Colors	100.0	100.0	*	100.0	100.0
56. Sorting Buttons	100.0	100.0	*	100.0	100.0
57. Comparison of Balls	100.0	100.0	*	100.0	0.0
58. Matches Three Colors	100.0	100.0	*	100.0	100.0
59. Train of Cubes	100.0	100.0	*	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	*	100.0	100.0

*No children in this occupational category.

TABLE XXVII

PERCENTAGE OF CHILDREN PASSING EACH ITEM ACCORDING TO AGE GROUP VI AND MOTHER'S OCCUPATION

Item	Group VI Percentage Passing				
	1	2	3	4	5
1. Recall Three Colors	100.0	100.0	100.0	50.0	100.0
2. Pictoral Memory	100.0	100.0	100.0	100.0	100.0
3. Recognizes Letters	100.0	100.0	100.0	100.0	66.7
4. Six Piece Puzzle	100.0	100.0	100.0	100.0	100.0
5. Matching Symbols	100.0	100.0	100.0	100.0	100.0
6. Adds Parts to Man	100.0	100.0	100.0	100.0	100.0
7. Copies M or N	100.0	100.0	100.0	100.0	66.7
8. Folds Paper	100.0	100.0	100.0	100.0	100.0
9. Identifying Parts	100.0	100.0	100.0	100.0	100.0
10. Matches Like Objects	100.0	100.0	100.0	100.0	100.0
11. Tapping Sequence	100.0	100.0	100.0	100.0	100.0
12. Repeats Story	100.0	100.0	100.0	100.0	33.3
13. Follows Three Directions	100.0	100.0	100.0	100.0	66.7
14. Repeat Sentence	100.0	100.0	100.0	50.0	0.0
15. Identify Noise	100.0	0.0	100.0	0.0	100.0*
16. Counts to Five	100.0	100.0	100.0	100.0	100.0
17. Repeats Three Digits	100.0	100.0	100.0	100.0	100.0
18. Repeats Sentence	100.0	100.0	100.0	100.0	100.0
19. Repeats Two Digits	100.0	100.0	100.0	100.0	100.0
20. Repetition of Words	100.0	100.0	100.0	100.0	100.0
21. Skips	100.0	100.0	100.0	50.0	33.3
22. Heel Toe Walk	100.0	100.0	100.0	100.0	100.0
23. Running Broad Jump	100.0	100.0	100.0	100.0	100.0
24. Balances on One Foot	100.0	100.0	100.0	50.0	100.0
25. Walks Backwards	100.0	100.0	100.0	100.0	100.0
26. Sitting from Prone Position	100.0	100.0	100.0	100.0	66.7

TABLE XXVII (continued)

Item	Group VI Percentage Passing				
	1	2	3	4	5
27. Hops One Foot Twice	100.0	100.0	100.0	100.0	100.0
28. Broad Jump	100.0	100.0	100.0	100.0	100.0
29. Jumps in Place	100.0	100.0	100.0	100.0	100.0
30. Balances on One Foot	100.0	100.0	100.0	100.0	100.0
31. Picks Longer Line	100.0	0.0	100.0	100.0	100.0
32. Copies Cross	100.0	100.0	100.0	100.0	100.0
33. Imitates Square Demo.	100.0	100.0	100.0	100.0	100.0
34. Draws Man—3 Parts	100.0	100.0	100.0	100.0	100.0
35. Imitates Bridge	100.0	100.0	100.0	100.0	66.7
36. Copies Circle	100.0	100.0	100.0	100.0	100.0
37. Form Board	100.0	100.0	100.0	100.0	100.0
38. Tower of 6 Blocks	100.0	100.0	100.0	100.0	100.0
39. Imitates Stroke	100.0	100.0	100.0	100.0	100.0
40. Stringing Beads	100.0	100.0	100.0	100.0	100.0
41. Opposite Analogies	100.0	100.0	100.0	100.0	100.0
42. Picture Vocabulary	100.0	100.0	100.0	100.0	100.0
43. Defines Words	100.0	100.0	100.0	100.0	100.0
44. Talks about Pictures	100.0	0.0	100.0	50.0	33.3
45. Repeats Twelve Syllable Sentence	100.0	100.0	100.0	100.0	100.0
46. Follows Directions	100.0	100.0	100.0	100.0	100.0
47. Comprehends Cold, Tired, Hungry	100.0	100.0	100.0	100.0	100.0
48. Identifying Pictures	100.0	100.0	100.0	100.0	100.0
49. Tells Name	100.0	100.0	100.0	100.0	100.0
50. Picture Vocabulary	100.0	100.0	100.0	100.0	100.0
51. Look Alikes	100.0	100.0	100.0	100.0	100.0
52. Comprehension	100.0	100.0	100.0	100.0	66.7

TABLE XXVII (continued)

Item	Group VI Percentage Passing				
	1	2	3	4	5
53. Knows Age	100.0	100.0	100.0	100.0	100.0
54. Comprehension	100.0	100.0	100.0	100.0	100.0
55. Recognizes Colors	100.0	100.0	100.0	100.0	66.7
56. Sorting Buttons	100.0	100.0	100.0	100.0	100.0
57. Comparison of Balls	100.0	100.0	100.0	100.0	100.0
58. Matches Three Colors	100.0	100.0	100.0	100.0	100.0
59. Train of Cubes	100.0	100.0	100.0	100.0	100.0
60. Identifies Objects by Use	100.0	100.0	100.0	100.0	100.0

APPENDIX N

TABLES XXVIII AND XXIX

APPENDIX N

TABLE XXVIII

ANALYSIS OF THE RELIABILITY BETWEEN RATER 1 AND RATER 2

Item	Rater 1 versus Rater 2		
	Fisher[a] Exact Test	Phi Coefficient	Coefficient of Contingency
1	1.000	.000	.000
2	1.000	.000	.000
3	1.000	.000	.000
4	0.500	.378	.354
5	*	*	*
6	1.000	.000	.000
7	1.000	.000	.000
8	*	*	*
9	*	*	*
10	*	*	*
11	*	*	*
12	.500	.258	.250
13	1.000	.000	.000
14	1.000	.000	.000
15	.500	.258	.250
16	1.000	.000	.000
17	*	*	*
18	*	*	*
19	*	*	*
20	*	*	*
21	.500	.378	.354
22	.500	.378	.354
23	1.000	.000	.000
24	1.000	.000	.000
25	1.000	.000	.000
26	1.000	.000	.000
27	1.000	.000	.000
28	*	*	*
29	*	*	*
30	*	*	*
31	1.000	.000	.000
32	1.000	.000	.000
33	*	*	*
34	.500	.258	.250
35	*	*	*
36	1.000	.000	.000

TABLE XXVIII (continued)

Item	Rater 1 versus Rater 2		
	Fisher[a] Exact Test	Phi Coefficient	Coefficient of Contingency
37	*	*	*
38	*	*	*
39	*	*	*
40	*	*	*
41	1.000	.000	.000
42	1.000	.000	.000
43	*	*	*
44	1.000	.000	.000
45	1.000	.000	.000
46	*	*	*
47	*	*	*
48	*	*	*
49	*	*	*
50	*	*	*
51	*	*	*
52	1.000	.000	.000
53	1.000	.000	.000
54	1.000	.000	.000
55	1.000	.000	.000
56	*	*	*
57	1.000	.000	.000
58	1.000	.000	.000
59	*	*	*
60	*	*	*

*Statistics not applicable since all items were socred correct by both raters (examiners).

[a]All Fisher statistics indicate no significant correlation between rater and ratings.

TABLE XXIX

ANALYSIS OF THE RELIABILITY BETWEEN RATER 1 AND RATER 3

Item	Rater 1 versus Rater 3		
	Fisher[a] Exact Test	Phi Coefficient	Coefficient of Contingency
1	1.000	.000	.000
2	*	*	*
3	1.000	.000	.000
4	1.000	.000	.000
5	*	*	*
6	1.000	.000	.000
7	1.000	.000	.000
8	*	*	*
9	*	*	*
10	*	*	*
11	.500	.143	.141
12	1.000	.000	.000
13	1.000	.000	.000
14	1.000	.000	.000
15	1.000	.000	.000
16	1.000	.000	.000
17	*	*	*
18	*	*	*
19	*	*	*
20	*	*	*
21	1.000	.000	.000
22	1.000	.000	.000
23	1.000	.000	.000
24	*	*	*
25	.500	.277	.267
26	1.000	.000	.000
27	.500	.277	.267
28	*	*	*
29	*	*	*
30	*	*	*
31	1.000	.000	.000
32	1.000	.000	.000
33	1.000	.000	.000
34	1.000	.000	.000
35	*	*	*
36	.500	.277	.267
37	*	*	*
38	*	*	*
39	*	*	*

TABLE XXIX (continued)

Item	Rater 1 versus Rater 3		
	Fisher[a] Exact Test	Phi Coefficient	Coefficient of Contingency
40	*	*	*
41	1.000	.000	.000
42	1.000	.000	.000
43	1.000	.000	.000
44	1.000	.000	.000
45	1.000	.000	.000
46	*	*	*
47	0.500	.174	.172
48	*	*	*
49	*	*	*
50	*	*	*
51	*	*	*
52	1.000	.000	.000
53	*	*	*
54	1.000	.000	.000
55	1.000	.000	.000
56	1.000	.000	.000
57	.500	.277	.267
58	1.000	.000	.000
59	*	*	*
60	*	*	*

*Statistics not applicable since all items were scored correct by both raters (examiners).

[a]All Fisher statistics indicate no significant correlation between rater and ratings.

APPENDIX O

TABLE XXX

APPENDIX O

TABLE XXX

ANALYSIS OF VALIDITY OF SCREENING TEST BASED ON A COMPARISON WITH THE MSCA BY FUNCTIONAL AREAS

Functional Areas: Screening Test	McCarthy	X^2	Phi Coefficient	Contingency Coefficient
Visual Memory	Verbal	3.764	0.424	0.390
	Perceptual Performance	10.469*	0.638	0.538
	Quantitative	2.078	0.323	0.307
	Memory	10.286*	0.630	0.533
	Motor	0.202	0.143	0.141
Auditory Memory	Verbal	4.405**	0.451	0.411
	Perceptual Performance	0.240	0.152	0.151
	Quantitative	2.795	0.363	0.341
	Memory	18.071*	0.814	0.631
	Motor	2.169	0.323	0.308
Gross Motor	Verbal	0.205	0.000	0.000
	Perceptual Performance	2.216	0.329	0.313
	Quantitative	0.145	0.135	0.134
	Memory	1.125	0.250	0.243
	Motor	15.365*	0.756	0.603
Visual Motor Integration	Verbal	0.003	0.092	0.091
	Perceptual Performance	9.333*	0.607	0.519
	Quantitative	0.115	0.009	0.009

TABLE XXX (continued)

Functional Areas: Screening Test	McCarthy	X^2	Phi Coefficient	Contingency Coefficient
	Memory	0.518	0.191	0.187
	Motor	0.019	0.088	0.088
Language Development	Verbal	9.846*	0.647	0.543
	Perceptual Performance	0.416	0.190	0.187
	Quantitative	6.982*	0.545	0.479
	Memory	1.500	0.289	0.277
	Motor	0.000	0.073	0.073
Concept Development	Verbal	2.521	0.367	0.345
	Perceptual Performance	2.743	0.364	0.342
	Quantitative	3.819	0.418	0.386
	Memory	3.636	0.405	0.375
	Motor	0.453	0.187	0.184

*Significant at the .01 level.

**Significant at the .05 level.

APPENDIX P

TABLE XXXI

APPENDIX P

TABLE XXXI

COMPARISON OF THE SIX FUNCTIONAL AREAS OF SCREENING TEST AND SEVEN FUNCTIONAL AREAS OF PET WITH THESE FIVE FUNCTIONAL AREAS OF MCCARTHY

Functional Areas	Fisher Exact Test	Phi Coefficient	Coefficient of Contingency
	McCarthy's Scale of Children's Ability Verbal Functional Area		
SCREENING TEST			
1. Visual Memory	.313	.383	.358
2. Auditory Memory	.438	.293	.281
3. Gross Motor	.566	.228	.222
4. Visual Motor Integration	.313	.383	.358
5. Language Development	.063	*	*
6. Conceptual Development	.938	.067	.067
PET			
1. Gross Motor	.875	.098	.097
2. Visual Memory	*	*	*
3. Auditory Perception	*	*	*
4. Auditory Memory	*	*	*
5. Visual Motor Integration	.188	.537	.473
6. Conceptual Development	.875	.098	.097
7. Language Development	.063	*	*

TABLE XXXI (continued)

	Fisher Exact Test	Phi Coefficient	Coefficient of Contingency
	McCarthy's Scale of Children's Ability Perceptual Performance Functional Area		
SCREENING TEST			
1. Visual Memory	.003	.856	.650
2. Auditory Memory	.192	.364	.342
3. Gross Motor	.392	.218	.213
4. Visual Motor Integration	.003	.856	.650
5. Language Development	.250	.447	.408
6. Conceptual Development	.250	.447	.408
PET			
1. Gross Motor	.450	.218	.213
2. Visual Motor	*	*	*
3. Auditory Perception	*	*	*
4. Auditory Memory	*	*	*
5. Visual Motor Integration	.136	.462	.420
6. Conceptual Development	.550	.218	.213
7. Language Development	.250	.447	.408
	McCarthy's Scale of Children's Ability Quantitative Functional Area		
SCREENING TEST			
1. Visual Memory	.083	.561	.489
2. Auditory Memory	.700	.048	.048
3. Gross Motor	.300	.333	.317
4. Visual Motor Integration	.542	.153	.151
5. Language Development	.125	.683	.564
6. Conceptual Development	.875	.098	.097
PET			
1. Gross Motor	.758	.143	.141
2. Visual Memory	*	*	*
3. Auditory Perception	*	*	*
4. Auditory Memory	*	*	*
5. Visual Motor Integration	.350	.303	.290
6. Conceptual Development	.758	.143	.141
7. Language Development	.125	.683	.564

TABLE XXXI (continued)

Functional Areas	Fisher Exact Test	Phi Coefficient	Coefficient of Contingency
	McCarthy's Scale of Children's Ability Memory Functional Area		
SCREENING TEST			
1. Visual Memory	.063	.545	.479
2. Auditory Memory	.019	.655	.548
3. Gross Motor	.392	.218	.213
4. Visual Motor Integration	.003	.856	.650
5. Language Development	.250	.447	.408
6. Conceptual Development	.250	.447	.408
PET			
1. Gross Motor	.450	.218	.213
2. Visual Memory	*	*	*
3. Auditory Perception	*	*	*
4. Auditory Memory	*	*	*
5. Visual Motor Integration	.007	.832	.640
6. Conceptual Development	.550	.218	.213
7. Language Development	.250	.447	.408
	McCarthy's Scale of Children's Ability Motor Functional Area		
SCREENING TEST			
1. Visual Memory	.500	.135	.134
2. Auditory Memory	.500	.126	.125
3. Gross Motor	.0007	.882	.661
4. Visual Motor Integration	.141	.405	.375
5. Language Development	.500	.258	.250
6. Conceptual Development	.500	.258	.250
PET			
1. Gross Motor	.233	.377	.354
2. Visual Memory	*	*	*
3. Auditory Perception	*	*	*
4. Auditory Memory	*	*	*
5. Visual Motor Integration	1.000	.480	.433
6. Language Development	1.000	.000	.000
7. Conceptual Development	.500	.258	.250

*No relationship was computed since one of the variables had a variance of zero.

VITA

Carolyn Marie Hall was born in Boston, Massachusetts, on August 2, 1944. She is the daughter of Frederick Dorius Gravel and Beatrice Anne Souza Gravel. She attended grammar school in Canton, Massachusetts. She moved to Melbourne, Florida, and graduated from Melbourne High School in 1962. She attended Brevard Community College, graduating in 1965, and Florida Atlantic University where she received her Bachelor of Arts degree in 1967. That year she began her teaching career at Meadowlane Elementary School in Melbourne, Florida, where she taught children ages five through seven in a nongraded school. She was responsible for teaching reading, language arts, and mathematics.

She moved to Knoxville, Tennessee, where she taught for Knoxville City Schools as a special education teacher at Pond Gap School. She received her Master of Science degree in Elementary Education with an emphasis in diagnostic and corrective reading from the University of Tennessee in 1970.

She moved to Morristown, Tennessee, in 1970, where she taught reading, children's literature and psychology as a part time instructor at Walters State Community College. She then began work on a Doctor of Education degree at the University of Tennessee. While in Morristown, she taught kindergarten for the Clinch-Powell Educational Cooperative and directed three day care centers for Morristown-Hamblen Day Care Centers, Inc.

In 1974, she moved to Boone, North Carolina, to assume a position in the Developmental Evaluation Center of the Special Education Department at Appalachian State University. In 1977, she assumed a teaching position with Caldwell Community College and Technical Institute, where she is an instructor in the Early Childhood Education Department. She received her Doctor of Education degree from the University of Tennessee, Knoxville, in 1978. Her degree was in curriculum and instruction with collateral work in early childhood education, educational administration and supervision, and children's literature.

She has conducted numerous workshops in diagnostic and corrective reading and has lectured in the Elementary Education and Home Economics Departments at Appalachian State University.

She resides in Boone with her husband Ralph, and their three children, Craig, Jennifer, and Jonathan.