AN INVESTIGATION OF THE VALIDITY AND PREDICTIVE VALUE OF
THE NPSDE, A PRESCHOOL ASSESSMENT DEVICE

THESIS

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

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August, 1974

The problem under investigation was the predictive value of a preschool screen. The subjects were 111 kindergarteners.

First, the need for a preschool screen was established. Second, the literature concerning other preschool devices was reviewed. Third, a specific screen was assessed in terms of validity. Fourth, a consideration of the predictive value of this screen in relation to scholastic achievement as indicated by the Metropolitan Readiness Test was made. A multiple regression analysis was performed, and the cross-validation of a number of prediction equations and cutoff scores was significant. Although statistical significance was achieved, high-risk youngsters could not be accurately identified. This research indicated that the instrument evaluated shows promise if refined by additional research.

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CHAPTER I

THE NEED FOR A PRESCHOOL SCREEN

Today's fast-paced world is a complicated place. Yet in a society where atoms have been split and men have successfully walked on the moon, no real advances have been made into understanding the nature of man. The child, no longer considered a miniature adult, is yet an unexplored area in comparison to man's knowledge of his immediate physical world.

The study of the child prior to his entrance into school has been a long and frustrating task. The efforts of researchers to assess the academic potential of very young children have been highly unreliable.

The first reason for the low reliability of early assessment devices were that they were largely physiological. The physical anomalies that are included within the normal limits medically, and those illnesses that appear to leave no medical evidence of aftereffect are suspected of producing subtle cerebral dysfunctions that become manifest in learning handicaps of numerous and varying sorts. Thus, young children who appear normal and healthy physically, may not be normal and healthy cognitively.

A second reason would be the rapid, erratic development of the preschool child. This rapid and erratic development
creates a very wide range of individual differences; therefore the establishment of precise, meaningful, reliable norms is especially difficult.

Third, attention, motivation, and persistence are factors that are often lacking in the behavior of a young child. Hence, it cannot be assumed that his performance at the time of assessment has been optimal.

Last, inherent within the attempt to predict intelligence is the assumption that potential pre-exists in any child, and must only mature out. Different philosophical schools of thought present conflicting theories on intelligence, its nature and its origin. During this century the concept of intelligence as fixed, predetermined, and unfolding automatically as the child matures evolved from the Piagetian concept of intelligence. Within this framework, intelligence develops through the individual's interactions with his environment.

The problem in early assessment devices lies not only in their methods, but also in the measurement of a process continually changing with the development of the child. The child's ultimate level of attainment depends largely on the stimulation that he will receive in the future.

In our realization that early assessment devices have not proven highly predictive, we find that they can still be useful in determining current status and requirements. We do influence future experiential input, and we may one day
find that predictions can be made from early assessment plus a planned educational program. The sensori-motor theory of cognitive development has its roots in Piagetian theory, and also in the neurophysiological insights which have been generated from Strauss' work with the brain-injured and from advances in the neurological field of medicine. As a result of Strauss' work, efforts to explain and remediate learning disabilities have had a tremendous impact on education in the past decade. These efforts have given impetus to the early programming as a preventative and/or remedial measure, and have been responsible for the creation of Project Head Start. The enthusiasm for Head Start popularized these theories of cognitive development so that universal preschool programs have been urged for public school systems around the country. In some areas, programs of stimulation are being experimentally pursued with children from birth.

Public concern for the effects of early experience on ultimate learning potential was reflected in Connecticut in 1969, when the legislature enacted Section 10-76 of General Statutes (6). Local Boards of Education are now required to "identify, to evaluate the education for . . . preschool age children whose educational potential will be irreparably diminished without special education at an early age"(6). The interpretation of this law requires that evaluations be provided for an increasingly broad spectrum of the preschool population, and a practical means for providing such evaluations is the problem.
In some other states, programs for four-year-olds are already required by law. Evelyn Omwake (4), in her "Guest Editorial" in the January, 1969, issue of Contemporary Education, calls for programs that not only reach four-year-olds, but also three-year-olds. She stated that "research has demonstrated that disadvantaged three-year-olds are behind their more advantaged agemates in knowledge, skills and over-all performance." She asks public education to recognize its responsibility to the three-year-olds and to cooperate with private preschools in the establishment of continuity, and to resolve the problems that exist in the available programs.

In this same issue of Contemporary Education, Brude Gardner stated that as a result of necessity, we will "discover or manufacture ways to provide meaningful and relevant educational experiences for all segments of the population of preschoolers"(1). These experiences will not only diminish educational deprivations, but they will also provide planned programs for the development of all preschoolers.

In his book, Intelligence and Experience, J. McV. Hunt (3) outlines the history of man's quest for an understanding of the nature of intelligence. He describes Piaget's concept of intelligence as a problem-solving capacity based on a hierarchical organization of symbolic representations and information-processing strategies deriving from past experiences. This conception has gained support from current
knowledge in the fields of neuropsychology and computer-
programming. This theory contradicts the long-maintained con-
ception that intelligence is predetermined, fixed, and
unfolding automatically with anatomical maturation.

Hunt (3), also, notes that an appropriate learning sit-
uation depends upon the match between experience and the
individual's preparedness to relate to it. Since every
individual is a unique phenotype, with his own genetic make-
up and his own background or experiences, and consequently
his own schemata, there can exist no one single educational
program appropriate for all children. Therefore, we can see
the value of a preschool screen as an aid in achieving such
a match.

Arguments have been posed that the preschool screen reveals
little that an astute teacher has not discovered on her own
during the first few weeks of school. There are serious hazards
created in postponing the assessment of the child's learning
preparedness until after he has been exposed to normal
classroom expectations.

The child who is unable to meet these reasonable expec-
tations is immediately and tragically vulnerable to whatever
happens to him in this brand-new, overwhelming situation.
He will quickly experience his inadequacies, and negative
attitudes toward school, himself, and the whole learning
process will solidify before a teacher can recognize the
child's problems and make accommodations for his needs.
Those schools that use a preschool screen in conjunction with visual and auditory screening during a spring kindergarten registration period, will have developmental assessment of each child well in advance of September. This information will alert the schools and the parents of the need for remediation and/or special attention to developmental deficits. Those physical problems requiring medical assessment will also be detected and the appropriate referral and follow-up may be accomplished prior to school opening. Provided with information of the needs of a specific incoming kindergarten class, the school can create prekindergarten summer programs or arrange the scheduling of specialists and the routing of school buses. As a result of the preschool screen, when any specific child arrives in school on the first day, the teacher will know what his reasonable expectations are and find a program with suitable motivation at his level of readiness.

Thus, in conclusion, the usefulness of a preschool screening device would not only serve to acknowledge academic potentials of youngsters, but it would also assist school personnel in preventing school alienation. Specific programs can be constructed to stimulate and motivate youngsters. The ability-grouping of youngsters according to readiness in math and reading would help meet the needs of the gifted, the average, and the slow learners. The stimulation of the child to learn at this early age would, hopefully, help to motivate later
academic performance. If today's public education is to meet the individual needs of each pupil, an effective screen must be constructed and used to identify special youngsters before severe educational problems occur.

A Statement of the Problem

The purpose of this study is to provide supportive evidence for preschool screening devices. This study is an assessment of what types of items should be included within, and which developmental areas indicate relevant information about the preschool child. This study will experimentally assess the Nonnewaug Pre-School Developmental Evaluation, hereafter referred to as NPSDE, in terms of validity. This evaluation of the NPSDE will be done through the comparison of NPSDE with an ideal preschool screen.

The NPSDE is an evaluation supplying formal information of a child's developmental, physical, emotional and educational history. It was constructed in the spring of 1973 by the Nonnewaug Pre-School Developmental Evaluation Committee for the purpose of evaluating the level of development of each child planning to enter the kindergarten program within the Nonnewaug Regional School District #14. The members of this committee were: a school psychologist, a reading consultant, a speech specialist, a learning disabilities specialist, school nurse, two elementary school principals, and a kindergarten teacher.
Method

Subjects

The Ss were 111 Caucasian children that represent the total kindergarten population enrolled in Regional School District #14, serving the towns of Woodbury and Bethlehem, Connecticut. Woodbury and Bethlehem are small rural communities located in the hilly, southern New England countryside. The total number of students that attend public schools within this regional district is slightly below 2,000. Nine of the total 111 youngsters were dropped from this study because they moved from the district, or entered the district after fall classes began. For these youngsters, measurement on all instruments was not possible. The ages of these youngsters at the time of the MRT administration were from five years, two months, to six years, one month, with all youngsters being born within the 1968 calendar year. Of the 102 in the remaining population, fifty-eight were females, and forty-four were males.

Instruments

The NPSDE, the Metropolitan Readiness Test, Form B (hereafter referred to as MRT) and the Draw-A-Man Test were the instruments administered to all Ss.

The NPSDE consists of two major parts: a developmental history, the NPSDH, and a developmental inventory, the NPSDI.
The MRT consists of six separate tests: the first test, "Word Meaning," measures the child's memory for verbal concepts. The second test, "Listening," yields an index of the youngster's knowledge of the world around him, and his ability to comprehend sentences and paragraphs. The third test, "Matching," measures those visual-perceptual skills akin to those involved in discriminating word forms in beginning reading. The fourth test, "Alphabet," measures a child's ability to recognize letters of the alphabet when spoken by the examiner. The fifth test, "Numbers," measures a broad area of numerical concepts including number concepts, number knowledge, and manipulative quantitative relationships, to name just a few. The last test, "Copying," measures a child's visual-motor ability (2).

The Draw-A-Man was also administered at the close of the MRT.

**Procedure**

During the spring of 1973 prior to enrollment into kindergarten, letters were sent to the parents of those youngsters planning to attend kindergarten in September. These letters asked the parents to kindly bring their youngsters to school and arrange for a time when the NPSDE would be administered. The professional staff, the reading consultant, speech specialist, learning disabilities specialist, and elementary principal administered the NPSDE. One staff member met with the parent and child and assigned them an appointment. Appointments were arranged for every forty-five minutes during school time for
the first week of May. Of the 111 total youngsters tested, seven of these enrolled later than the May testing date, and were evaluated prior to the beginning of school in September.

When the parent and child arrived for their appointment, the child worked with the examiner and, concurrently, the parent completed the NPSDH in another classroom.

The MRT was administered to the entire population of the kindergarten youngsters attending Region #14 schools during the last two weeks of February, 1974. A nine-month period elapsed between the administration of the NPSDE and the MRT. This nine-month period included a five and one-half-month period of kindergarten training.

The MRT was administered in three sessions. The first session consisted of tests 1 and 2; the second session, tests 3 and 4; and the third session, tests 5, 6 and the Draw-A-Man. The sessions ran less than thirty minutes per day, and were held on three consecutive days. Those youngsters who were absent from school for any or all testing sessions were made-up at a rate of one per day. This was accomplished by the youngsters during the next day or days of attendance. At the concluding session of the MRT, the Draw-A-Man Test was given.

The instructions given to the youngsters were: "Draw the best picture of a man that you can." Therefore, the interpretation according to the test norms was invalid. The mental age obtained from the test norms was converted to an IQ score (IQ=M.A./C.A. X 100). The IQ scores were not used as a measure of intelligence; they were used as a predictor variable.
The evaluation of the NPSDE was done via the comparison of the NPSDE with an ideal preschool screen. Nine months later, the 102 kindergarten youngsters that received the NPSDE were administered the MRT. The youngsters' performance on the NPSDE was compared to their performance on the MRT. A step-wise multiple regression analysis, with cross-validation, was performed on the data in an attempt to discover which variables, if any, were good predictors of later academic performance.

Definition of Terms

Certain terms are used throughout this paper. They are operationally defined as follows:

Kindergarten is that initial ten-month period of instruction offered by the public schools in many states for children of approximately five years of age prior to their entrance to the first grade. It usually consists of half-day sessions and has a curriculum of activities in which the children are expected to participate.

Preschool refers to that period immediately prior to the child's entrance into public schools.

Prekindergarten is used synonymously with the term preschool.

Readiness is the state of preparedness within a person which makes for optimal learning. It refers to what Tyler (5) has called "the when to teach," in respect to a person's ability to perceive the new information and to modify behavior.
Qualified Examiner is an individual that is trained in methods of administering and scoring psychological and educational tests. In most instances this is synonymous with psychologist or psychometrist.


CHAPTER II

CURRENT MEANS OF EVALUATING PRESCHOOL READINESS, AN OVERVIEW

The preschool screening of large numbers of young children presents quite a challenge to educators. Use of existing instruments is highly impractical, since young children must be screened individually. The best available instruments are lengthy and must be administered by a qualified examiner. The examiner must consider the preschool child's motivation and interest. Also, since the child's attention span is quite short, he is very susceptible to fatigue. Shyness, distractability and negativism are also part of his make-up. Therefore, scoring of this preschool child's responses tends to be subjective.

The Merrill-Palmer Scale (10) and The Minnesota Preschool Scale (6) are two such tests that have good scope, but are inefficient for mass screening. The appropriateness of timed tests in the Merrill-Palmer Scale is questionable since preschoolers are rarely motivated to meet a time limit. Also questionable was the use of near-point tasks and language tests without gross-motor activities and sensory evaluations.

It is, therefore, true that some 'preschool' screens are 'reading readiness' evaluations, and that these devices neglect the importance of the 'pre-reading readiness' in the developmental processes.
The Gesell Preschool Schedule (5), developed at the Yale Clinic of Child Development in the 1930's, established a standard for the intensive longitudinal observations of developmental patterns. These developmental patterns existed in four general areas: motor, adaptive, language, personal-social. These "case-study" type observations were not subjected to standardization procedures or statistical validation. The Gesell Preschool Schedules were based upon a small sample of select individuals from a homogenous, rather privileged background. The application of expectations of children's abilities derived from Gesell's Schedules onto children of other backgrounds exposes these children to frustration and failure. A current updating of the norms from The Gesell Preschool Schedule will hopefully be based upon a wider spectrum of population, and also recognize the limits of the appropriateness of the norms.

School Readiness (7), written by Ilg and Ames of the Gesell Institute, describe other school readiness procedures. However, the research used in the development of these procedures was derived from one middle class community. Other methodological problems were also present in these readiness procedures.

The Anton Brenner Developmental Gestalt Test of School Readiness (1) and the Riley Preschool Developmental Screening Inventory (9) are non-verbal assessment devices. Riley's Inventory requires the child to draw five geometric figures, and one human
figure; whereas Brenner's has an effective range of prediction limited to five or six-year-olds. Riley's Inventory was developed with a poverty population, a percentage of which were non-English speaking. The exclusion of any linguistic assessment in these devices discounts the enormous effects that language has on a child's level of readiness. The use of these devices on non-poverty populations is inappropriate, and their results would be questionable.

The Preschool Attainment Record (2) is a useful extension of the Vineland Social Maturity Scale (3). However, these procedures rely on the reporting and/or evaluation of a child's skills by a third person, usually a parent. The direct observation of the child is a much more reliable method for the evaluation of a child's abilities.

The School Readiness Survey (8), constructed by Jordan and Massey, was designed to be administered by parents. This survey contains seven tests which are believed to measure a child's readiness to enter kindergarten. Also, the child's general social maturity is measured via a checklist. Egeland (4), in his review of the School Readiness Survey, found that parents rated their own children more favorably than other people rated them. Egeland also said that this survey was of little value in making decisions about a child's readiness for kindergarten.
In summary, the currently available tools for the assessment of preschoolers contain one or more of the following flaws:

1. They are lengthy, involve special materials, and/or require professional examiners and are impractical for the screening of large numbers of children.

2. They establish standards for performance without appropriate normative data.

3. They lack adequate, accurate 'yardsticks' for measuring this rapidly developing age group.

4. They cover too broad an age range, and lack emphasis on the preschooler.

5. They lack a broadness in the areas of skills assessed.

6. They lack direct observation by trained examiners, and require reliable reporting, usually by parents.

7. They represent reduced measures of school-age levels of cognitive functioning.

8. They inappropriately assume that test-taking attitudes will be positive, and that also assume the presence of a high level of motivation.
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Philosophers, expounding their beliefs as to the nature of the child, have been present since man himself existed on earth. These schools of thought on the nature of the child can be categorized. Sullivan (20), in his 1970 article in Educational Technology, noted that many of these philosophical positions overlap, and he divides them into three categories. These different schools of thought represent the predeterministic, the tabula rasa, and the interactionalist theories.

The natural development of the child has been emphasized by predeterministic theories. Maturation occurs as a child passes through specific, delineated stages of development. The child must pass through each progressive stage in order for development to occur. Cultural or environmental factors are relatively ineffective in implementing change in this fixed sequence of development. The writings of Rousseau, Froebel, and Pestalozzi are all within the predeterministic philosophy. G. Stanley Hall, Freud, Gesell, and Piaget represent contemporary predeterministic theorists. In their theories of child development, Freud, Gesell, and Piaget all emphasize a maturation occurring through various ordered stages. In a review by Gagne' (6), he stated that Gesell emphasized that
maturation and the presence of certain organized patterns of growth must occur before learning can have any effect on the child. Piaget (16) has said that the child's stage of development would explain what he could learn as a result of genetic unfolding.

In contrast, *tabula rasa* or blank slate theories, stress the importance of the role of the environment on the child's development, and discount his genetic heritage. Within this framework, the human organism is readily pliable. John Locke, a 17th-century political philosopher, first proposed the *tabula rasa* theory. During the twentieth century John B. Watson (23), B. F. Skinner (19), and other behaviorists are among those individuals who place primary emphasis on the environment. According to Gagne' (6), learning involves changes in a child's behavior over short periods of time, while development involves other capabilities observable over longer periods of time.

The third major theoretical vantage point is that of the interactionist, or, to use another term, the transactionalist. The transactionalist also emphasizes the effects of behavior on development, but he emphasizes only those behaviors that occur as a result of interactions between the organism and its environment. Olson (15), in *Child Development*, states that it is not simply the child plus environment, but maturation times nurture or, child times environment. This results in integrations on the part of the child "that are qualitatively and quantitatively different from the previous level of
development" (8). In order for development to occur, a close parallel must exist between the level of stimulation from the environment and the level that the child can integrate.

Cowles (3), in her 1971 review, "Four Views of Learning and Development," presented a somewhat different schema of classification. These four views of learning and development were behavioral-environmental, cognitive-transactional, psychosexual-personality and normative-maturational.

The behavioral-environmental view

... includes the reinforcement-learning theory of Skinner, the developmental behavior-analysis approach of Bijou and Baer, and the cumulative learning model of Gagne'. In the more classical form, this has been known as "S-R" psychology or, simple behaviorism.

In brief terms, this view is strongly allied with a receptive or passive orientation to human development based on the belief that the environment, within certain broad genetic limits, shapes the man. The child becomes the adult his environment has made him. (3).

The cognitive-transactional view of human learning and development includes Piaget's genetic epistemology, Heinz Verner's organismic-developmental approach and Bruners and Hunt's information-processing approach.

The cognitive-transactional approach "views man as a naturally active, seeking, adapting being who learns and is shaped through continual transactions (most of which he initiates) with the environment" (3).

The cognitive-transactional view

According to Piaget, the child is born with a set of sensorimotor operations (or responses) to perform upon the environment in order to identify it with himself. As a result of these interactions, and
physiological maturation, the original sensorimotor operations are:
(a) progressing into increasingly more complex patterns.
(b) internalized so they can be carried out mentally.
(c) tied to language symbol and language systems.
This development takes place on a continuum of three main hierarchal stages: the sensorimotor, in which the physical environment is acted on directly, the concrete operations stage, in which classes of objects and actions are formed, mentally related to each other, and represented in language, and the classes and series of the second stage with the addition of hypothetical-deductive thinking and problem solving (3).

The psychosexual-personality view has its origin in the psychoanalysis of Sigmund Freud. The adaptations of Anna Freud, Erik Erikson, and Robert White of Freud's theory reflect relevance to understanding children's development. Classical Freudian or psychoanalytic theory states that man's behavior is governed primarily by his irrational impulses and affectivity. How the child copes in each of a series of psychosexual stages through which he passes determines the kind of adult he will become.

The child is believed to be born with certain basic drives and appetites (represented by the id) which must be controlled by the ego, so that the child can acceptably function within society (represented by the superego). Erikson, in *Childhood and Society* (5), states that the child channels these drives into different stages at different developmental levels. Each drive is identified with a particular part of the body, and at each stage an important
developmental issue is present. Five of Erikson's "eight stages of man" apply to the child. They are oral-sensory (trust vs. mistrust), muscular-anal (autonomy vs. dependence), locomotor-genital (initiative vs. guilt), latency (industry vs. inferiority), and puberty-adolescence (identify vs. role conflict). The mechanism involved is partly environmental and partly maturational.

The normative-maturational is best represented by the work of Gesell and his associates (7). Also included in this developmental classification is the work of Lorenz and other evolutionists.

Within this approach, man is viewed as being primarily the product of his genetic inheritance, and only secondarily the product of his experience in the environment. The child becomes an adult in much the same manner that the acorn becomes the oak. Each child is thought to be born with a full set of genes to guide his development. Given the proper nourishment and physical-psychological setting, he will achieve each stage of growth and development on a predetermined schedule. Therefore, environmental experience influence only (a) the relative ease with which more general developmental patterns take, for example, the general pattern language, might be particularized to "English." Physiological maturation is the main mechanism of development (3).

Although these two different schema of classification appear quite similar, they are also very different. In an analysis of the factors that define the specific classifications of each schema, contradictions are present. These theories most popular today among developmental and child psychologists are those of Piaget and Gesell.
Predictive Criteria

Prediction of school success has been present for a relatively brief history in educational psychology. Although Boring, in his 1950 book, *A History of Experimental Psychology* (2), did not specifically refer to prediction or prognosis, he did originate the experimental development of diagnosis of behavior; the first step in successful prediction. During that same year, Monroe stated, "The prime purpose of prediction is to provide information which may be used in the guidance and counseling of individuals. Thus conceived, attempts to forecast success or achievement must be diagnostic, as well as, prognostic" (14).

Much of the research relating to success predictions affecting young children centers upon factors associated with reading readiness. In response to the question of the worth of reading readiness tests as predictors of reading success, conflicting reports are present in past research.

In Sutton's (21) seven-year study on individual reading progress, she concluded that past performance in reading was a non-significant predictor of future reading success. A similar conclusion was given by Karlin (9). Karlin compared the scores of 100 first grade students on Metropolitan Achievement Test and a reading achievement test. He reported that the
relationship between the readiness test and the reading test was small.

Studies by Powell (17), Koppitz (11), and Mitchell (13), to name just a few, found that significant relationships did exist between reading readiness tests and achievement tests. These results are in direct opposition to those of Sutton and Karlin. The only explanation for this discrepancy was the lack of agreement as to what constituted a measure of reading readiness. Allen (1), in an attempt to clarify this problem, analyzed those abilities used as predictors of reading readiness. In her six-month analysis, she concluded that reading achievement was more closely associated with a knowledge of letter names and sounds than with abilities taught in reading readiness workbooks.

Most achievement test batteries do not extend downward to encompass the kindergarten youngster. Of those that do, most are too lengthy, and/or represent a reduced measure of school age levels of cognitive functioning. According to a review by Dykstra (4), the MRT is the most valid and reliable readiness instrument available.

Another area of predictors of school success is drawings. Although research in this area is limited, review was believed necessary.

Thomas and Sjah (22), in a study based in Indonesia, assessed the use of the Draw-A-Man Test as a psychometric tool. In their research, Thomas and Sjah utilized teacher
ratings of intelligence and teacher grades as independent variables. They reported correlations of .42, .43, and .26 between the Goodenough scoring and the teacher grades in arithmetic, reading, and Sundanese, respectively. On the basis of these significant results (beyond .01 level of confidence), the authors state that the results indicate that the use of Draw-A-Man Test in estimating school abilities is justified "until a more adequate test has been developed"(22).

In a study by Koppitz and others (11), the Bender Gestalt was compared with the Lee-Clark Reading Readiness Test as a predictor of success on the Metropolitan Achievement Test. All correlational coefficients obtained were statistically significant, and thus the authors concluded that the Bender Gestalt Test was as good a predictor of success as the readiness test. One drawback in using the Bender Gestalt Test is that it must be individually administered.

An earlier study by Koppitz (12) stated, "Results show that the Bender and the Drawings both have the ability to predict achievement, but this power increases when they are used together as multiple predictors"(12).

Figure and Gestalt drawings would appear to hold promise as predictive tools, although only a limited amount of research supports this contention.

Tasks devised by Piaget and Gesell were also used as predictors of first grade achievement. In a study by Kaufman and Kaufman (10), the effectiveness of the tests constructed from
tasks devised by Piaget and Gesell as predictors of first grade achievement were evaluated.

It is well known that conventional intelligence tests have been found useful for the prediction of school achievement. The present study has shown that tests built from Piaget's and Gesell's tasks may, also, be quite effective as predictors of school achievement. Some other Piaget-based tests have been shown to be good predictors of arithmetic achievement (Dodwell 1961; Freyberg 1966) and of achievement in a variety of school subjects (Almy, Chitterden, & Miller 1966; Goldschmit & Bentler 1968; Miller, Stephens, & McLaughlin 1969). However, most previous studies either evaluated a Piagetian test of limited coverage or used criteria of achievement that were not at the same levels of psychometric excellence and broad curricular coverage as major achievement battery such as Stanford Achievement Test.

One notable exception is a longitudinal study carried out by Dudek, Lewter, Goldberg and Dyer (1966). They administered nine of Pinard and Laurendeau's (1964) 27 tests to 100 kindergarten children to obtain a broad base of evaluations on Piagetian concepts. Total score on these tests correlated .63 with com-posite achievement on the California Achievement Test in the first grade, proving to be the best of four predictors (including two intelligence tests). This substantial correlation, together with the virtually identical correlations of the Piaget Battery with the Stanford Achievement Test found in the present study, gives strong evidence that tests built from Piaget's tasks may be very effective for the prediction of achievement in traditional school subjects. Clearly, tests based on Piaget's theory would seem to be useful for conventional curriculums and need not be restricted to those curriculums with a specific Piagetian orientation.

The results of the present study, also, offer strong empirical support of the effectiveness of the Gesell School Readiness Tests as a predictor of school achievement. Although Ilg and Ames have been expounding this position with fervor based on their vast clinical experience (Ames 1967; Ilg & Ames 1965), it is obvious that the empirical justification is both necessary and long overdue. However, Ilg and Ames's claim that teething level is an effective predictor of school readiness was not borne out (10).

Serwer and others (18) stated:
Teacher's ratings were better predictors than were the standardized test measures. It should be pointed out that since the kindergarten, not first grade teacher, completed the ratings there was probably no ""Pygmalion" effect, i.e., self-fulfilling prophecy. Among the standardized tests, the readiness and learning aptitude tests were the most useful, followed by the intelligence tests. Least valuable in first grade achievement prediction were the perceptual and motor tests (18).

In the present study teacher's ratings were not used. They were omitted from the study because the teachers had full knowledge of test results.
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CHAPTER IV

THE IDEAL PRESCHOOL SCREEN

This chapter begins with a clarification of reasons for testing. Then follows a discussion of the characteristics of an ideal testing instrument. Next, a list is presented of those special considerations to be included within an ideal preschool testing device. Last, a discussion of the NPSDE in comparison to an ideal preschool screening device is presented.

Testing in itself is not an end but a means to an end. Tests are instruments used to gather information. They supply information used in gaining a more thorough understanding of the individual being tested. Tests can also aid in making decisions regarding a specific individual or group.

As a result of the particular test used, testing has various purposes. Lennon (6) lists six purposes for testing. They are as follows.

First, tests supply measures of stature in particular skills of content areas for a student, a class, a school, or a district. Tests indicate a level of skills or abilities for a specific individual or group. This information provides clues to the appropriate level of instruction.

Second, tests supply measures of growth, development, or progress toward desired educational goals. These measures of growth presuppose repeated administration of tests. But, as a result of the repeated measurement, we infer progress.
Third, tests supply measures of differential status. The application of these measures reveals an individual's strengths and weaknesses.

Fourth, tests provide analytical or diagnostic information.

Fifth, tests provide inventories of skills. One result of these skill inventories is checks on an individual's progress. Another result would be the construction of guides for further instruction.

Lennon's last idea of the purpose of testing was that "Tests are one source of data essential for continuing evaluation of the adequacy of the total instructional program"(6).

Characteristics of the Ideal Testing Instrument

According to Anastasi, "a psychological test is essentially an objective and standardized measure of a sample of behavior"(1). In the construction of a testing instrument, many factors must be considered. These factors include

1. A subjective decision whether or not the test adequately covers the behavior under consideration.

2. A subjective decision whether or not this test can adequately identify, diagnose, and predict.

3. A subjective decision whether or not the test serves as an indicator of a relatively broad and significant area of behavior.

4. Standardization or uniformity of procedure in administration and scoring of the test.
5. Establishment of normative data.

6. The administration, scoring, and interpretation of scores must be independent of the subjective judgements of individual examiners.

7. Is this test valid, or does it accomplish the purpose for which it was intended?

8. For tests with predictive value, the test items must have an empirical correspondence to the behavior the test claims to predict.

9. This test must be reliable. The consistency of scores obtained by the same persons when retested with the identical test, or an equivalent form of the test, is the test's reliability (1).

In my opinion, the following characteristics should also be incorporated within an ideal preschool test:

First, the ideal preschool instrument should be administered to the child individually.

Second, the instrument should be brief, no longer than twenty to thirty minutes, because of the limited attention span of young children. If it is necessary to go beyond thirty minutes, the testing should be done in two or more sessions.

Third, the use of timed items is inappropriate, in that youngsters of this age have a relatively undeveloped conceptualization of the passage of time. Therefore, their conceptualization of the passage of time has no relationship to the completion of the task at hand.
Fourth, testing should be done by appointment so that unnecessary waiting is avoided.

Fifth, the child should be familiar with the surroundings and the person administering the instrument. This is necessary so that the child is comfortable and able to give his best. The room used for testing should not be large, and the furniture should be child-size.

Sixth, the test should be sufficiently broad in scope. This scope should test a broad area of skills, yet the test should not require a lot of testing paraphernalia.

Seventh, a test of readiness for preschoolers being registered for kindergarten should indicate the readiness of the child for school. In any population of youngsters chronologically old enough to enter kindergarten, it is expected that a majority of these youngsters will be ready for kindergarten. A proportion of this same population will be ready to an extraordinary degree, but the remaining proportion of youngsters will not be ready. Testing should identify these three groups and should supply information which can be used in planning programs that would meet the varying needs of the children.

Eighth, testing of youngsters entering kindergarten should be part of the comprehensive testing program of a school system.

Ninth, testing should be a cooperative, successful venture with the establishment of a positive relationship between the schools and the community.
Tenth, a joint effort in planning, carrying out and follow-up of the testing should exist between school personnel and the concerned individuals of the community. A presentation given by school personnel on the merits and purposes of testing should be arranged for the community.

An ideal preschool screen would seek to achieve all specific criteria mentioned above. Typically, this ideal screen would contain two major parts. The first part, a developmental history, would be filled out by the parents, while the youngsters' abilities were evaluated by the second part, the developmental inventory.

The developmental history could be broken down into specific areas. These areas would obtain information concerning family relationships, developmental aspects, behavioral aspects, attitudes and interests, health, and previous educational experiences. Examples of developmental histories are found in Appendix A. The first, the Questionnaire for Parents, was constructed by Bangs (3). Although this questionnaire could be considered as a format for a clinical parental interview, a complete account of all aspects of the child is identified by this questionnaire. Gesell (5) provides a General Outline of Interview (also included within Appendix A) in The First Five Years of Life. In comparing their formats, Bangs' Questionnaire for Parents very adequately obtains information on all facets of the child, whereas Gesell's lacks the completeness found in Bangs'. Bangs' Questionnaire provides a fine model for an ideal preschool developmental history.
The second example of a Preschool Developmental History was devised by the Brookfield Public Schools, Brookfield, Connecticut. This developmental history lacks the thoroughness of Bangs' questionnaire. Both developmental histories do obtain necessary background information on the preschool child.

The second and more important part of our ideal preschool screen would be the developmental inventory. This inventory should include the following general areas: language and communication skills, visual-perceptual skills, gross motor skills, fine motor skills, body awareness, social skills, and verbal skills. These general areas are roughly those used by Gesell (5). Most developmental inventories include variations of these general areas. Most developmental inventories have been constructed by using items from Gesell's Preschool Schedules and other standardized tests. Bangs' (3) Language and Learning Assessment exemplifies this. An excellent example of another developmental inventory is the Learning Problems Checklist (2), also found in Appendix B.

The Nonnewaug Pre-School Developmental Evaluation was undertaken to overcome the handicap present within schools because of the lack of formal information on the developmental, physical, emotional, and educational history of the child. The schools are handicapped in that they cannot plan programs to meet and remediate specific needs of the preschoolers. It is also believed that "all of the child's pre-school experiences may be critical to his development and progress in school"(7).
The NPSDE has a major emphasis on

the joint cooperation of both parent and school personnel in assessing a youngster's level of educational development. Although our entire technique can be used and will be used for the identification of specific disabilities, our orientation and philosophy is geared toward assessing ability. We are interested in what children know and what they can do rather than emphasizing what they don't know and what they cannot do. Our positive emphasis on ability rather than disability can be seen on the developmental history as we ask questions about the experiences pre-school youngsters have had, such as trips, museums, etc. We are, also, interested in whether a youngster has had previous nursery school or other social experiences and we would like to know about specific interests and abilities which a youngster may indeed have already manifested prior to his initial experience with school. We, also, ask traditional "developmental" questions which contribute to our overall estimate of a youngster's level of maturation. Prior to our actual formulation of the developmental inventory, we surveyed the inventories, scales, and procedures of other pre-school evaluation programs. We found that many scales emphasized one or possibly two indices of development. Our goal was to create a balance, getting as much information on a child on as many indices as time, attention span, and common sense allow. Our goal is measuring a youngster's development along significant indices which relate to personal, academic, and social adjustment. There is almost an infinite number of questions and procedures that can be asked of a child which provide useful information for instructional and experiential purposes. We chose items which take advantage of short attention span, need for fun, need for physical exercise, and communicate that school personnel provide a human, warm and pleasant experience. Our developmental history and inventory reflect the combined input of all the professional disciplines involved in the Nonnewaug district including administration, special services and early instructional staff. Our committee met for many day-long sessions recently to develop this entire procedure.

Our inventory consists of a section on 1) "Self and Body Awareness." Here, we are looking for a youngster's individual concept of himself and his relationship to the world around him. 2) Our second section assesses a youngster's "Visual-Perceptual Development." Here, we are interested in color recognition, fine motor coordination and development.
3) Our third area of evaluation is "Gross Motor Control." Test items involve jumping, hopping, throwing, catching and walking. 4) Our fourth section is "Conceptual Development." Here, we are interested in a youngster's language and number concepts development. 5) "Transcoding Skills," our fifth section, provides us with information about a youngster's pre-reading, reading, pre-writing and writing abilities. 6) The sixth section, provides information about a youngster's "Speech Development."

All in all, we hope that A) we have provided both a procedure and techniques which allow for maximum parental input at the beginning of a youngster's school experience, and B) we have composed a scale which provides reliable and valid information on each child which leads to the individualization of instruction. C) that the overall impression communicated to a child during his initial experience with school is that learning can be fun and school personnel provide warm, human experiences (4).

In a validity analysis of the NPSDH, the developmental history (found in Appendix A) adequately covers all developmental history areas defined by Gesell and Bangs. The NPSDH does not contain as in-depth developmental analysis as does Bangs. But it does adequately screen developmental areas. If a specific area required additional clarification, this clarification was sought outside of the NPSDE.

The NPSDI, the developmental inventory (found in Appendix B), also adequately samples behavior from all developmental skill areas mentioned earlier. However, the child's listening skills are not evaluated, and an evaluation of the child's skills in this area should be incorporated within the NPSDE.

The NPSDE does conform to all special considerations listed earlier in this chapter. The NPSDE is administered individually; it is brief, twenty to thirty minutes; it contains
no timed items; an appointment for testing is necessary; the child is tested in a classroom which he has visited before; and the furniture is small. The NPSDE tests a broad area of skills; it indicates a child's level of readiness. The NPSDE was incorporated into the comprehensive testing program for the district; and last, community cooperation in all facets of the NPSDE was stressed.

The summary found at the close of Chapter II lists the flaws or inadequacies present in many of the currently available assessment devices. In my opinion, the NPSDE does overcome most of these pitfalls. However, the NPSDE does not overcome the following pitfalls: 1) Administration requires a qualified examiner. 2) Standards for performance were not generated from the normative data.

If these pitfalls are analyzed, a qualified examiner is a necessary evil, for valid results. Therefore, the only pitfall of the NPSDE is the lack of normative data. The strengths, as well as the weaknesses, of the NPSDE should be mentioned. The NPSDE is a short device that does not require special materials, and is highly practical for the screening of large numbers of preschool youngsters. If standards for performance were established as a result of appropriate normative data, the NPSDE would represent an adequate measurement device. The NPSDE does assess a wide range of skill areas and the age range is limited to the preschooler. The NPSDE includes a parental report of developmental and behavioral aspects and an inventory assessing the quality of many relevant skills. The NPSDE is
not a reduced or watered-down measure of school-age cognitive functioning, but a device constructed specifically for the preschooler. In that the NPSDE "chose items which take advantage of a short attention span, need for fun, need for physical exercise,"(4) those who administer the NPSDE do not inappropriately assume that test-taking attitudes of the preschooler will be positive.

In summary, the NPSDE has a great potential as a preschool screening device. The limitations of the NPSDE's use would lie in the lack of thoroughness of its norms and its reliability.


CHAPTER V

RESULTS AND DISCUSSION

The data contained nine criterion variables and forty-eight predictor variables. These variables are all listed in Appendix D. The analysis of the data was aided by the NTSU Computer Center. Several different statistical programs were used to analyze the data.

First, the population of 102 Ss was divided into two samples of 51. These samples contained equal numbers of males and females. These samples were randomly obtained by the computer. Next, on the first sample, a stepwise multiple regression (Program ST041) was performed on this data. From this analysis each criterion variable was correlated with each predictor variable, and their correlations were ranked and listed. A prediction equation utilizing the ten predictor variables that best predicted each criterion was derived. Then, the ten most significant variables from the first sample were cross-validated by utilizing them in a stepwise multiple regression procedure on the second sample (Program ST004). Those variables that remained significant represent valid predictor variables. Last, the criteria values generated by the prediction equations from the first sample were correlated with the actual values of the second sample.
In the first part of the computer analysis of sample one of the data, the stepwise multiple regression, most predictor variables yielded significant correlational coefficients. In fact, for the first criterion variable, 41 of the 48 predictor variables were significant at the .005 level or above. Table I, found in Appendix E, lists all those significant predictor variables generated by the stepwise multiple regression. The number of these correlations attributed to chance is not known; therefore a cross-validation of these predictor variables by the second sample was necessary.

This cross-validation was achieved by the forcing of the ten best predictor variables for each criterion variable into the second sample, and analyzing the amount of correlation attributed to each variable. These correlations were also corrected for shrinkage. Table II, found in Appendix E, contains the numbered predictor variables, their correlations on samples one and two, and the correlation value corrected for shrinkage. In interpreting the data from Table II, the predictor variables have cross-validated.

Also within the cross-validation of the linear regression was a comparison of single predictor variables to criterion variables. Table III (Appendix E) lists these variables, their F-ratios, and their levels of confidence. These single predictor variables are computed without holding constant the other nine predictor variables. It was noted that if the norms from the MRT are used, the strength of the correlation increases.
Table IV (Appendix E) contains the same predictor variables as found in Table III, but in this case the other nine predictor variables that make up the multiple regression were held constant. The square of these correlational coefficients represents an estimate of the percentage of variance within the criterion variable that the predictor variable contains.

The last part of the analysis was the cross-validation of the complete prediction equation. The Beta weights generated by the first sample were placed in the prediction equation, and the actual and the predicted values for the criteria were calculated and correlated. These correlations are listed in Table V (Appendix E).

Not all the prediction equations remained significant through this cross-validation. For those prediction equations that did not hold up through this cross-validation, the criteria variables were not significantly related to the predictor variables. But, for those variables that did, the statistical significance sets a foundation for future research. The variables utilized have proven valid, and now the practical, or real world value of the NPSDE must be assessed.

First, criterion variable 5, "Numbers," yielded the largest correlational value, and it was chosen for analysis. A frequency distribution of the actual values of this variable was constructed for sample one data. Those youngsters whose predictor scores fell at the low end (lowest 20% more or less) of the distribution were considered to be high risks for
academic failure and to be in need of a specific program for remediation. Utilizing the predicted values of the criterion (prediction equation from sample 1 utilizing data from sample 1), a cutoff score (7.99) was selected that maximized classification of high- and low-risk groups (see Appendix E, Table VI, sample 1). The high-risk group were 60% correctly identified and less than 3% of the low-risk students were incorrectly identified. Thus, for every 6 high-risk students correctly identified, 1 low-risk student was incorrectly identified. A chi-square test was performed on this data and was significant at .01 level. The prediction equation also failed to identify 4 youngsters that should have been included within the remediation program but were not.

Sample 2 (Appendix E, Table VI) shows that the cutoff scores for values of the criterion generated from the prediction equation were not successfully cross-validated even though the chi-square values were still significant at the .01 level. At a practical level only 56% of the high-risk group for poor academic achievement were correctly identified while 17% of the low-risk group were incorrectly identified. Thus 58% of the group predicted to be high-risk were incorrectly identified (false positives).

Discussion

The specific prediction equation for "Numbers," a subtest of the MRT, yielded statistically significant predictor variables, yet from a practical standpoint these predictor
variables were of little practical utility for identifying a high-risk population. What now exists is a base—the beginnings of a practical useful instrument. To improve the prediction equation for a criterion variable, analysis of the predictor variables that compose the regression equation must be achieved. Numerous changes can be implemented within the NPSDE. Those changes that increase the value of the multiple correlations and can be directly implemented within the school setting, should be selected. The addition of new variables to the already existing inventory in an attempt to increase its worth as a predictor of academic achievement is indicated.
A number of preschool screening devices are available. However, a review of the literature failed to reveal a single study that attempted to use these devices for selection of a high-risk group and cross-validated the prediction variables, prediction equation, and cutoff scores. The results of this study suggest that it would probably not be valid to utilize such devices to select a high-risk population. In order for a high-risk group to be accurately identified, much additional refinement of existing preschool devices must be achieved.

Research in this area of school psychology is just beginning. The development of a preschool screening with good predictive value is a necessity for the establishment of effective remediation programs.

In conclusion, the NPSDE is a positive step toward the development of a preschool screen with good predictive value. A widening of the scope of the developmental areas assessed and the introduction of additional variables may increase the predictive value of the NPSDE. Future research will evaluate those developmental areas that will increase the predictive value of the NPSDE.
APPENDIX A

QUESTIONNAIRE FOR PARENTS

Date........................................

Child's name........................Birthdate........................................

Information given by.................Relationship..................................

Do you feel that the child has a problem?...........................................

Note: The following questions are asked so that we can better understand your child. Please read them carefully and answer as fully as possible. If you are not sure how to answer some of the questions, please tell us and we will discuss them. If you need more space, use the back of the sheet.

SECTION I

1. Is mother Rh negative?........Did mother have any illnesses during her pregnancy with this child?.......Did mother have to stay in bed?.......Take medications(other than vitamins)?.....Almost have a miscarriage?.......If yes to any of these, explain .................................................................

Has mother had previous miscarriages?........................................

2. Was labor very long or especially short?....If yes, estimate time......Was the birth of this child normal?....................

If not, explain.................................................................

How much did child weigh?..................

3. Did child have any trouble breathing after birth?.......Was child kept in an incubator or airlock over 12 hours?........Why?.......Did child look blue or yellow after birth?.......For how long?.......Did child come home from hospital with the mother?.......If not, Why?.................................

4. Is child adopted?.....How old was he when he was adopted?....
SECTION II

1. At what age did child sit alone?....Crawl?....Walk by himself?....Was child very active as a baby?.............

2. Was feeding the child a problem?.....Why?.....When was he taken off the bottle?.....Was weaning a problem?.....

3. Is child a 'picky or fussy eater' now?....Does he seem to have any trouble swallowing?.....Chewing?.....Will he eat meat, caramels, etc?.....Does child eat with a spoon?.....Fork?.....Both?.....Is he messy?.....Can he spread butter?.....Cut his own meat?.....

4. Was toilet training a problem?.....When was child completely trained?.....Does child wet the bed at night now?.....How frequently?.....Does child wet or soil himself during the day?.....How often?.....

5. Does child dress himself completely?.....Partially?.....Does he completely undress himself?.....Partially?.....Does he button?.....Tie shoes?.....

6. Does child fall frequently?.....How well can he climb?.....Throw a ball?.....Hit a ball?.....Ride a trike?.....Ride a two wheel bike?.....Run?.....

7. Which hand does child use to eat with?.....Draw or write?.....Throw a ball?.....

SECTION III

1. Has child been back in the hospital since birth?.....If so explain(operations, accidents, etc.) and give his age at this time

2. Has child had other serious illnesses?.....If so, describe.
3. Has child ever fainted or passed out? Has he ever had a convulsion? How many? Describe.

4. Does child have any problem hearing? Has he had ear infections, running ears, ears lanced? If so, explain.

5. Does child complain of frequent headaches, stomachaches, leg cramps?

6. Does child see normally? Does he have glasses?

7. Is child allergic?

8. Does child take any medicine regularly except vitamins? Why?

9. Has child been seen by a neurologist? Psychologist? Had an EEG? Has his speech or hearing been tested before now? Has child had training in a speech, hearing and language center?

SECTION IV

1. Was child very quiet as a baby (did not babble and coo as much as most babies)? Did he cry excessively?

2. How old was child when he began to say words? How old was child when he began putting 2 or 3 words together in a phrase?

3. How much does child talk now?

4. How much of this speech can mother understand? All, Most, Some. How much can other adults understand? All, Most, Some, None.

5. How much does child use gesture to help others understand?

6. Has child learned to say nursery rhymes? Prayers? Sing songs?
7. Do parents feel child stutters or stammers?

8. Does child's voice sound like other children's voices? 
   If no, describe. Very soft......Very loud......Hoarse......
   Nasal......Other......

9. Have parents done anything to help child with his speech?...
   ....If so, explain.................................

SECTION V

1. Did child attend Nursery School?......Kindergarten...........
   Did he have any problems in Nursery School or Kindergarten?.
   ....If so, explain...................................

2. What grade is the child in at present?......Has he repeated
   any grades?......What grade is he now making in reading?....
   ..Spelling......Arithmetic......Writing......Conduct........

3. Does child like to go to school?......Does he seem to have
   many friends at school?......Does he seem to remember school
   assignments?......Can he follow directions in school?........

SECTION VI

1. Below is a list of words which describe children's personality
   and behavior. Please circle those which you feel tend to de
   scribe your child.
   sad          leader          happy          follower
   moody       quiet          even tempered    very active
   friendly    independent   prefers to be alone dependent
   hard to discipline   has trouble sleeping
   has temper tantrums  is unusually fearful
   how often?......
   affectionate

2. Describe any behavior which is a problem to parents.........
   .................................................
3. Does child enjoy books (being read to or reading)?
   Does he like to watch TV? For how long?

4. What are child's favorite activities?

5. How well does child play alone? With younger children?
   With children his own age? With older children?
   With his brothers and sisters?

SECTION VII

1. Are parents now separated? Divorced? If so, how old
   was child when this occurred? Has either parent been married
   previously? Which one? Is either parent deceased?

2. Father's occupation
   Father's level of education
   Mother's occupation
   Mother's level of education
   If mother works, who takes care of child?
   How old was child when mother went to work?

3. Give names and ages of other children in the family?

4. Are there persons living in the home other than the parents
   and children? Who?

5. Is any language other than English spoken at home?

6. Are there relatives, on either side of the family, who have
   had: Trouble speaking clearly or who have been late to learn
   to talk? Trouble with their hearing?
   Trouble learning in school so that they left school or
   failed several grades, or who have had real trouble learning
   to read?
Problems like epilepsy, mental retardation, cerebral palsy, etc?.............If so, describe the problem..............
........................................................................
........................................................................

GENERAL OUTLINE OF INTERVIEW

(The following items are not to be used "in toto," but selectively. They are arranged roughly in genetic sequence.)

1. Age of child (always check). Status in home, how long?
2. Motor behavior
   - Age of walking; walks, falls, runs
   - Seats self small chair; climbs into big chair
   - Stairs, method, up-down
   - Tricycle
   - Skipping, jumping, etc.
   - Preferred hand
3. Language behavior
   - Jargon, gestures
   - Words; enumerate or estimate vocabulary
   - Joins two words; simple sentence
   - Tells experiences
   - Gives full name
   - Songs or nursery rhymes
   - Points to parts of body; knows what dog, cat say
   - Simple errand, same room
   - Fetch an object from another room
   - Carry out two commissions, another room
4. Play behavior
   - Favorite activity, toy
   - Interest in picture books
   - Knows pictures, points or names
   - Likes story read to him, kind of story
   - Doll-carry-put to bed, feed
   - Dramatic play
   - Imaginary playmates
   - Prints a few letters
5. Domestic behavior
   Feeds self, help, control
   Toilet, regulation, day, accidents
   Asks toilet, how
   Takes responsibility toilet
   Nap and night toilet habits
   Dress, undress, lace and tie shoes, buttons
   Helps mother at home

6. Emotional behavior
   Attitude toward strangers
   Amenability to control
   Play with other children

7. Health History
   General health
   Illnesses--unusual experiences

PARENT INFORMATION FORM

Child's Name: ___________________________ Date: ___________________________
Parent's Name: ___________________________

I. Family Information:
Members of Household (other than parents)

<table>
<thead>
<tr>
<th>Adults</th>
<th>Occupation</th>
<th>Children other than in Brookfield schools</th>
<th>Birthdate</th>
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I. Developmental Information:

1. What kind of baby was your child? ________
   (e.g. quiet of startled easily or always active)
   Any eating problems?  _______________________

2. When could your child walk by himself? _______________________

3. Was your child difficult to toilet train? Yes ___ No ___

4. Do you think your child walks and runs well? _______________________
   Does he bump into things or fall a lot? _______________________

5. Can your child play ball, throw and catch? _______________________

   What happens when he cannot do something? _______________________

7. Has your child used crayons, pencils and scissors at home?  ____________
   Does he like to use them?  _______________________
   Does he have difficulty using them?  _______________________

8. Is your child right or left handed?  ________ Always?  _______________________

9. Did your child attend pre-school?  _______________________

10. Does your child play with other children?  _______________________
    How does he get along with other children?  _______________________

Brookfield, Conn.
I. Behavioral Information:

A. General Information:

1. What is the best way to get your child to do something at home?
   a. Calling to him or going to get him?__________________________
   b. Showing him how to do something or explaining how to do something?
   c. Do you have to tell him something over and over again?_______

2. What generally motivates him to complete a task? (concrete, social, pride in accomplishment or intrinsic reward?)________________________

3. Is he fairly independent or does he need much direction and support from you to complete a task?

4. What do you find is the most effective method of correction?______

5. What kinds of things does your child spend his time doing at home?

6. Has he been easy or hard to manage?__________________________

7. During play activities does your child respond in any of these ways?

   Cannot play by himself    Yes   No
   Constantly changing activity Yes   No
   Seeks parental attention    Yes   No

IV. Attitudinal Information:

1. Is there any other significant family information that would help us understand your child?

2. Is there anything about your child which your have wondered about or that has been of concern to you?

3. Is there any special achievement or accomplishment; anything that your child has done of which you are particularly proud or which pleased you very much?
A. Were there any:

1. Complications during pregnancy or delivery (Rh factor, jaundice, toxemia, breech birth, etc.)

2. Circle one: Full term, early, late, natural, foster, adopted, other

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<th>YES</th>
<th>NO</th>
<th>COMMENT</th>
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B. Has your child ever had:

1. Trouble with his eyes
2. Trouble with his ears
3. Any physical handicaps or defects
4. High temperatures
5. Convulsions or fainting spells
6. Allergies or reactions to medicine
7. Serious illnesses (meningitis, encephalitis, pneumonia, etc.)
8. Any hospitalizations
9. Head injuries or serious accidents
10. Chronic diseases (heart, diabetes, etc.)

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<th>YES</th>
<th>NO</th>
<th>COMMENT</th>
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C. Is your child:

1. Currently taking medication?

D. Have you been:

1. Concerned about your child's speech or language development?

E. Have you had:

1. Any difficulty teaching him to talk?

F. Has your child had:

1. Any special testing, medical or psychological? What kind?
NONNEWAUG REGIONAL SCHOOL DISTRICT #14
Woodbury and Bethlehem, Connecticut

NONNEWAUG PRE-SCHOOL DEVELOPMENTAL HISTORY

Date

IDENTIFICATION
A. Child's Name
B. Date of Birth Sex
C. Address Phone
D. Name of Father or Guardian
E. Name of Mother or Guardian
F. Status of Parents: Married___Separated___Divorced___Widowed____
G. If child is adopted, what was age at adoption?
H. If a foster child, what was age at time of placement?

DEVELOPMENTAL HISTORY
(Check the appropriate blanks)
A. Birth Weight____ B. Birth Term: Full___Premature___Postmature____
C. Note any complications during pregnancy or delivery(such as breech birth, etc.) or in first months after birth.

D. Sitting: Sat alone before 9 months___after 9 months________
E. Creeping: Did not creep__Crept in hand and knee pattern__________
Crept in patterns other than hand and knee_________
F. Walking: Started before 15 months___after 18 months_________
G. Talking in sentences: before two years__at about 2 years____
after 2 years___Speech difficult to understand____
H. Listening: Appropriate____Poor____
I. Responding: Appropriate____Poor____

In which way do you think he or she is developing in the following:

J. Large muscle coordination (running, climbing, etc.): Skillful____
    Average____Awkward____
K. Talks to adults: Always____Sometimes____Never____
L. Using words himself: Large vocabulary____average____doesn't say much____
M. Self-care (Helps in dressing, washing, etc.): Independent____
    average____little____
N. Toilet trained (day): Yes___No___
    (night): Yes___No___
O. Stays with people other than mother: Happily____unconcernedly____
    reluctantly____
Q. Does things within reasonable time limits____is a dawdler____
R. Seems generally well coordinated____seems clumsy____falls down frequently____

HOME AND FAMILY BACKGROUND

A. Other language spoken at home?_____________________________________
B. Kinds of experiences (trips, museums, zoos, etc.)_____________________

_______________________________________________________________

C. Is child read to by adults?____older children_____________________
D. If child needs reprimanding, what form is used?_____________________

_______________________________________________________________

E. Does child play well with other children in the home?____out of the
    home?______________________________________________________
F. List names and ages of siblings in order of age:

_________________________________________  ____________________________

_________________________________________  ____________________________

_________________________________________  ____________________________

G. What can you tell us about the home that seems relevant? (Frequent moving, other relatives living in the home, either parent out of the home, visitation arrangements, etc.)

_________________________________________  ____________________________

_________________________________________  ____________________________

H. Previous nursery or other group experiences? (Sunday school, camp, etc.)

_________________________________________  ____________________________

I. Is child being given some small responsibilities around the home? (Picking up toys, helping mother, etc.)

_________________________________________  ____________________________

J. Interests and abilities (art, music, etc.)

_________________________________________  ____________________________

K. Is child eager to attend school?

_________________________________________  ____________________________

L. Are you concerned about your child's readiness for school?

_________________________________________  ____________________________

M. What is the basis for your concern?

_________________________________________  ____________________________

If you wish a conference with the school psychologist regarding this or any other area of concern, please call the Middle School (263-4306) for an appointment.
HEALTH HISTORY

A. List any serious illnesses and/or hospitalizations, with ages:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

B. List any physical difficulties? (Vision, Speech, Hearing, Coordination)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

C. List all special examinations and the results. (Visual, auditory, psychological, psychiatric, medical)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Is child on medication__ If so, what? ________________________________________

D. Does your child exhibit any of the following?

Thumbsucking __ Poor appetite __ Fainting or convulsions __
Rocking __ Tires easily __ Nose Bleeds __
Head-banging __ Headaches __ Temper tantrums __
Nail biting __ Bed wetting __ Irritability __

Any allergies?__ To what and how manifested? ________________________________

E. Needs naps: Daily__ sometimes__ rarely__ tires easily__

F. Bedtime hour: __________

Thank you for your assistance in providing us with the information included in this form.

________________________________________________________________________

Signature
APPENDIX B

"LEARNING PROBLEMS CHECKLIST"

Motor Development

1. Awkward running and climbing
2. Awkward balance—standing on one foot, walking line, low rail
3. Rigid Movements
4. Flaccid (limp body movements)
5. Lacks smoothness in walking up and down steps
6. Difficulty with hopping and skipping
7. Difficulty learning movements, sequences in games
8. Lacks smoothness in clapping, tapping, etc., in rhythm
9. Poor posture
10. Easily fatigued
11. Difficulty in cutting, pasting, coloring
12. Holds chalk/pencil awkwardly
13. Stokes too heavily or tightly
14. Works very slowly on simple pencil-paper tasks

Visual Perception (Interpreting visual stimuli)

1. Difficulty in matching (interpreting likenesses)—color, shape, size
2. Difficulty in discriminating differences—color, shape, form, size
3. Difficulty recognizing what's missing
4. Attention focused on irrelevant detail
5. Confuses fore and background
6. Frequently loses place on workpage
7. Difficulty with visual memory
8. Difficulty in interpreting reversible letters or words

Visual Motor (Production related to visual stimuli)

1. Must feel things or run fingers over page before reacting
2. Difficulty in assembling simple puzzles
3. Difficulty staying on line or within boundary lines
4. Poor orientation of drawings on page
5. Poor spacing of drawing, writing
6. Difficulty in making easy forms
7. Difficulty in copying simple patterns
8. Cramped or sprawled writing
9. Reverses or rotates angles, letters or words

Spacial Organization (Laterality, directionality, time, space)

1. Disoriented in room, building and playground
2. Untidy with clothing
3. Inconsistent hand preference
4. Confusion of left and right
5. Poor knowledge of body parts
6. Confusion with directionality (near-far, front-behind, above-below, big-bigger-biggest)
7. Feels or looks at chair before sitting
8. Reaches too far/short for things
9. Holds hands in wrong position for catching
10. Reacts too quickly or slowly to moving stimuli (like a ball thrown to him)
11. Disoriented in time
12. Misjudges distances in play and work activities
13. Difficulty with sequence

Regulation Behavior

1. Distractability—limited ability to screen out irrelevant stimuli, therefore has difficulty in focusing on task
2. Hyperactivity—restless activity (twisting, squirming, always up and down, tapping fingers or feet)
3. Hypoactivity—lethargic (seems to lack interest or motivation to learn through moving)
4. Perseveration—repeats excessively some words or actions without 'apparent' reason; gets stuck on some letter, sound or word; seems to need security of repeating same word or action over and over again
5. Disinhibition—grabs; puts hands where they don't belong; little regard for danger; can't wait—runs out of line; has to be first; little regard for regulations
6. Impulsivity—irresistible reactions to stimuli (focuses on paper to be rattled, walls to be fingered, books to be slammed, unusual sounds to be made, etc.)
7. Significant variation in performance levels from hour-to-hour, day-to-day

Language Development

1. Does not enjoy verbal games
2. Difficulty in recognizing differences in sounds or words presented verbally
3. Difficulty in identifying rhymes
4. Difficulty in understanding verbal directions
5. Difficulty expressing thoughts
6. Difficulty understanding meaning of words
7. Difficulty in classifying or categorizing words
8. Difficulty finishing incomplete words
9. Difficulty in blending separate parts of a word into a whole word
10. Difficulty with sentence structure or grammatic form
11. Difficulty reproducing from memory sequences presented verbally
Personality Development

1. Daydreams
2. Preoccupied with certain themes such as violence, desertion, etc.
3. Exaggerated emotional responses (cries too easily, laughs too loud, fears)
4. Nervous traits and mannerisms such as nail biting, thumb sucking, pencil chewing and the like
5. Needs constant approval
6. Rigidity—resists changes
7. Overly bold and aggressive
8. Seems to have difficulty in being accepted by peers

## NONNEWAUG PRE-SCHOOL DEVELOPMENTAL INVENTORY

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<th>Subtest</th>
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<th>Child's Score</th>
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### REGIONAL SCHOOL DISTRICT # 14

Woodbury and Bethlehem, Connecticut

Name__________________________________ Sex________ Date of Examination__ yr. mo. day __
Address________________________________ Date of Birth________
Telephone__________________________ Chronological Age________
School_______________________________ Examiner__________________

### I. Self and Body Awareness

A. Tell me your name-your first name-your last name?(2 pts.)

__________________________________________

B. How old are you?(1 pt.)____________________

C. Where do you live?(3 pts.)__________________

D. What is your telephone number?(1 pt.)_______

---

66
E. Touch your (7 pts.)

1. Feet ___ 5. Mouth ___
2. Hand ___ 6. Nose ___
3. Hair ___ 7. Eye ___
4. Ear ___ Total Subtest I 14 pts.

II. Visual Perceptual Development (use laminated picture of clown)

A. Look at this picture. What color is this balloon? (point to balloons in sequence) (6 pts.)

5. Blue___ 6. Purple___

B. Color the first balloon (point to first balloon) (2 pts.)

1. Fine coordination: Average__ Below average__ Refused__
2. Hand dominance: Right__ Left__ Mixed__
3. Note crayon grasp: Usual__ Unusual__
C. See this circle? Make one like this. Make it right here. Make another right here. (2 pts.)

D. See this square? Make one like this. Make it right here. Make another right here. (2 pts.)

1. Start: Top__Bottom__
2. Direction: Clockwise__Counter clockwise__
3. Average__Below average__Refused__

1. Average__(2 pts.) Below average__(1 pt.) Refused__(0 pts.)
III. Gross Motor Control

A. Show me how you jump. (2 pts.)
   1. Jumped____ (2 pts.) Attempted____ (1 pt.) Refused____

B. Show me how you hop on one foot. (Two attempts allowed)
   1. Foot dominance: Right____ Left____
   2. Hopped____ (2 pts.) Attempted____ (1 pt.) Refused____

C. Pick up the bean bag and throw it to me. (2 pts.)
   1. Coordination: Average____ (2 pts.) Below average____ (1 pt.)
      Refused____
   2. Hand dominance: Right____ Left____

D. Now catch the bean bag. (3 pts.)
   Successful____ (3 pts.) Unsuccessful____ (0 pts.)

E. Show me how you walk across our bridge. (Use balance beam) (2 pts.)
   1. Distance: Full____ Halfway____ (1 pt.) Refused____
   2. Manner: (Walks forward or sidles across, etc.)

F. Look at the pretty colors. (Kaleidoscope) (No score)
   1. Eye dominance: Right____ Left____

Total

IV. Conceptual Development

A. Language development (For scoring see scoring guide) (18 pts.)
   1. What's this? What do you call it? (Show set of pictures)

   Age 4=14 cor. a. plane ___
   Age 3=10 cor. b. telephone ___
   Age 2½=8 cor. c. hat ___
   Age 2 =3 cor. d. ball ___
   e. tree ___
   f. key ___
   g. horse ___
   h. knife ___
   i. coat ___
   j. ship ___
   k. umbrella ___
   l. foot ___
   m. flag ___
   n. cane ___
   o. arm ___
   p. jack knife___
   q. pitcher ___
   r. leaf ___
B. Number Concepts (Use set of ten blocks) (10 pts.)

1. Count the blocks for me. Allow two attempts if necessary.

One ___ Six ___
Two ___ Seven ___
Three ___ Eight ___
Four ___ Nine ___
Five ___ Ten ___

2. Give me three blocks. (2 pts.)

Correct ___ (2 pts.) Incorrect ___ (0 pts.) Refused ___
(replace blocks)

3. Give me six blocks. (2 pts.)

Correct ___ (2 pts.) Incorrect ___ (0 pts.) Refused ___

V. Transcoding Skills

A. What is this letter? (Show children the letter cards in succession) (14 pts.)

A ___ E ___ S ___ B ___ O ___ R ___ T ___

B. Do you know what this says? (Show picture of clown once more) (12 pts.)

See ___ the ___ happy ___ clown ___

C. Write your first name for me. (Allow two attempts if necessary)

1. First name ___ (5 pts.) Partially correct ___ (3 pts.)

Illegible ___ (1 pt.)

2. Hand dominance: Right ___ Left ___

3. Pencil grasp: Usual ___ Unusual ___

Total Score ___

VI. Speech Development (May be filled in by examiner at the conclusion of the testing situation)

A. Tell me about the picture. Yes No

1. Is easy to understand ___ ___

2. Uses sentences ___ ___

3. Talks easily ___ ___

4. Hesitates or repeats ___ ___

5. Makes sounds correctly ___ ___
Examiner's Comments:

A. Referrals:

1. Vision
2. Hearing
3. Learning Disability
4. Psychological
5. Reading
6. Speech

B. Summary:
APPENDIX C

EXAMINER’S MANUAL DEVELOPMENTAL INVENTORY

DEVELOPING RAPPORT

The child will arrive at examiner's station with name card. Pertinent comments should be made to relax the child and make him comfortable.

TESTING INSTRUCTIONS

I. Self and Body Awareness

A. Name Child may be reluctant and all efforts should be made to get the full name from him.

1. Full name 2 points
2. First name or nickname 1 point
3. Last name only 1 point
4. No response 0 points

B. Age Encourage verbal response. Signing can be scored as acceptable

1. Verbally correct 1 point
2. Hand sign correct 1 point
3. No response 0 points
4. Incorrect response 0 points

C. Residence Make all effort for total response of street, town and state.

1. Total of street, town, and state 3 points
2. Any two in combination 2 points
3. Any one part of address 1 point
4. No response 0 points

D. Telephone number Ask for repetition if child seems hesitant.

1. Totally correct 1 point
2. Incorrect or no response 0 points

E. Child must touch with hand or fingers each of the body parts listed.

1. Score one point for each correct response. 7 points

Total possible score Subtest I 14 points
II. Visual Perceptual Development

A. Present laminated picture of clown with balloons. Briefly discuss the picture with enthusiasm. DO NOT USE WORDS WHICH APPEAR BELOW PICTURE.

1. Score one point for each correct response (baby-talk accepted)

B. Child receives duplicated picture of clown. Ask for coloring of first balloon. Child can use any color he chooses.

1. Fine coordination
   a. Any reasonable attempt to stay within lines. 2 points
   b. Exhibits difficulty staying inside lines. 1 point
   c. Refuses. 0 points

2. Hand dominance
   a. Check appropriately. no score

3. Crayon grasp
   a. Check appropriately. no score

C. Circle Be sure to allow child two responses. Choose better response for score.

1. Start
   a. Check appropriate space. no score

2. Direction
   a. Check appropriate space. no score

3. Drawing circle (use primary pencil)
   a. Child should achieve circular movement in reproducing the circle. It need not be completely closed; can be approximately round or somewhat elliptical in shape. (If examiner is unsure, submit drawing to examining team for scoring.)

      best possible score 2 points
D. Square  Be sure to allow child two responses
(Use primary pencil)
Choose better response for score.

1. Figure should be thought of as a whole by the
child when executing drawing. Execution of
angles, proportion of the square and straight-
ness of lines should all be considered. Angles
are most important. (If examiner is unsure,
submit drawing to examining team for scoring.)
best possible score 2 points

Total possible score Subtest II 12 points

III. Gross Motor Control

A. Jump (examiner demonstrate if necessary, but be
sure to note same in VII, examiner's comments, B,
Summary, on last page of test booklet).

1. Executed jump, with both feet leaving ground
simultaneously. A jump in place or ahead is
acceptable. 2 points

2. Any attempt to jump other than as described
in number A 1. 1 point

3. Made no attempt. 0 points

B. Hop on one foot (examiner demonstrate if necessary,
but be sure to note same in VII, examiner's comments,
B, summary, on last page of test booklet.)

1. Executed hop in place or ahead. Must land on
same foot with which he began. 2 points

2. Any attempt to hop other than as described
in number B 1. 1 point

3. Made no attempt
   a. Foot dominance--check appropriate space.
   no score

C. Bean bag toss

1. Coordination--distance forward should be beyond
child's reach. Direction should be toward
target(examiner). Allow second attempt
if first one is unsuccessful. 2 points
2. Hand dominance--check appropriate space. no score

D. Bean bag catch--child should be just beyond examiner's reach (1 meter). Tester should use a gentle, underhand toss in order to encourage a successful catch. 3 points

E. Walk across bridge (examiner demonstrate if necessary, but be sure to note same in VII, examiner's comments, B, summary, on last page of test booklet.)

1. Distance

   a. Child moves in any fashion completely across balance beam without touching floor at any time. 2 points

   b. Any attempt to walk across balance beam other than as in E 1 a. 1 point

   c. Made no attempt 0 points

2. Manner

   a. Make note as to how child moved across beam, or other pertinent information. no score

F. Kaleidoscope

1. Eye dominance--check appropriate space. no score

Total possible score Subtest III 11 points

IV. Conceptual Development

A. Language development--present laminated picture vocabulary cards--in successive order. Encourage correct responses. Note a plural response by adding "s" to the printed word on test.

1. General guide for acceptable responses (score 1 point for each correct response.)

   a. Plane, airplane, jet, bomber
   b. Telephone, phone
   c. Hat, cowboy hat
   d. Name for any round base
   e. Tree--any kind
   f. Key, house-key, door-key, key-lock
   g. Any "horse" term
   h. Any knife or form of knife, letter-opener
   i. Coat, jacket
j. Ship, boat, ferry, steamer, liner  
k. Any derivation of umbrella, parasol, sunshade  
l. Foot, foot and toes, feet  
m. Flag, American flag, flag pole, flag and pole  
n. Cane, candy cane, walking stick  
o. Arm, muscle, fist, shoulder, elbow (make note of term used).  
p. Jackknife, penknife, Scout knife, pocketknife  
q. Pitcher, vase  
r. Leaf  
Best possible score 18 points  

B. Number concepts--place blocks in a line in front of child, blocks touching each other. Allow two attempts if necessary.  
1. Count--check space after each correct response  
Best possible score 10 points  
2. Three blocks--check appropriate space  
Best possible score 2 points  
3. Six blocks--check appropriate space  
Best possible score 2 points  
Total possible score Subtest IV 32 points  

V. Transcoding Skills--child may show reluctance to attempt this subtest. Encourage responses if at all possible.  
A. Letter recognition--show child 6 x 6 laminated letter cards, in order. Check space after each correct response (Score 2 points for each correct response).  
Best possible score 14 points  
B. Clown (reading)--use laminated picture of clown. Check space after each correct response (Score 3 points for each correct response).  
Best possible score 12 points  
C. Write name  
1. Encourage child to write first name, or nickname, with primary pencil on the back of the last page of the test booklet. Present paper the wide way, and if necessary, allow second attempt.  
   a. First name or nickname--all letters, in correct sequence, left to right. Accept common reversals.  
      5 points  
   b. Partially correct--mirror writing, or right to left, or part of name or nickname.  
      3 points
c. Illegible--scribble writing, or otherwise unreadable 1 point
d. Refused 0 points

2. Hand dominance
   a. Check appropriate space no score

3. Pencil grasp
   a. Check appropriate space no score

Total possible score Subtest V 31 points

VI. Speech development

A. Story telling--present picture of a situation and make note of child's ability to tell a cohesive story of at least two to three sentences.

1. Easy to understand.
   a. Check appropriate space no score

2. Uses sentences
   a. Check appropriate space no score

3. Talks easily
   a. Check appropriate space no score

4. Hesitates or repeats sounds, words or phrases
   a. Check appropriate space no score

5. Makes sounds correctly
   a. Make note of any very obvious exceptions to ability to make correct speech sounds

Total Subtest VI no score

CONCLUSION OF TESTING

A. At this point child has completed the pre-school evaluation and should be given a verbal acknowledgement of completion. Picture of clown on which he colored the first balloon on Subtest II., should be given to him to take with him.
B. If child has not had vision and hearing screening he should proceed to that station.

VII. Examiner's comments

A. Referral

1. - 6. If any child seems to be in need of more extensive testing in any of the areas listed, examiner should check in appropriate space.

B. Summary--Pertinent comments which might be of value in determining the total picture of the child should be recorded here. Examiner should not feel that extensive writing is necessary however, comments are valuable! Be sure to include the following information.

1. Examiner had to demonstrate a jump for child(subtest III A)

2. Examiner had to demonstrate a hop for the child(subtest III B)

3. Examiner had to demonstrate a walk across the bridge for child(subtest III E)

4. Note if child did not look physically well or healthy.

Examiner will complete scoring box on page one at the conclusion of testing.
APPENDIX D

CRITERION VARIABLES

1. Score on MRT, Test 1, Work Meaning.
2. Score on MRT, Test 2, Listening.
3. Score on MRT, Test 3, Matching.
4. Score on MRT, Test 4, Alphabet.
5. Score on MRT, Test 5, Numbers.
6. Score on MRT, Test 6, Copying.
7. Total Score obtained on MRT.
8. Percentile Rank of Total Score.
9. Stanine of Total Score.

Note: Criterion Variables 8 & 9 were obtained by applying the child's total score to Tables 1 and 3 respectively of the Manual of Directions, Metropolitan Readiness Test.

PREDICTOR VARIABLES

1. IQ obtained from D-A-M.*
2. Age in months.
3. Score on NPSDI, Self and Body Awareness, Item A.
4. Score on NPSDI, Self and Body Awareness, Item B.
5. Score on NPSDI, Self and Body Awareness, Item C.
6. Score on NPSDI, Self and Body Awareness, Item D.
7. Score on NPSDI, Self and Body Awareness, Item E.
8. Score on NPSDI, Visual and Perceptual Development, Item A.
9. Score on NPSDI, Visual and Perceptual Development, Item B.
10. Score on NPSDI, Visual and Perceptual Development, Item C.
11. Score on NPSDI, Visual and Perceptual Development, Item D.
12. Score on NPSDI, Gross Motor Control, Item A.
13. Score on NPSDI, Gross Motor Control, Item B.
14. Score on NPSDI, Gross Motor Control, Item C.
15. Score on NPSDI, Gross Motor Control, Item D.
16. Score on NPSDI, Gross Motor Control, Item E.
17. Score on NPSDI, Conceptual Development, Item A.
18. Score on NPSDI, Conceptual Development, Item B.
19. Score on NPSDI, Transcoding Skills, Item A.
20. Score on NPSDI, Transcoding Skills, Item B.
21. Score on NPSDI, Transcoding Skills, Item C.
22. NPSDI Total Score.
23. Score on NPSDI, Identification, Item F.
24. Score on NPSDI, Identification, Item G.

*The IQ's obtained from the D-A-M using the Goodenough scoring criteria, and the general IQ formula, that IQ=M.A./C.A. X 100. These values should not be considered as a valid IQ indicator. The directions given were "draw the best picture of a man that you can."
25. Score on NPSDH, Developmental History, Item A.
26. Score on NPSDH, Developmental History, Item B.
27. Score on NPSDH, Developmental History, Item C.
28. Score on NPSDH, Developmental History, Item D.
29. Score on NPSDH, Developmental History, Item E.
30. Score on NPSDH, Developmental History, Item F.
31. Score on NPSDH, Developmental History, Item G.
32. Score on NPSDH, Developmental History, Item H.
33. Score on NPSDH, Developmental History, Item I.
34. Score on NPSDH, Developmental History, Item J.
35. Score on NPSDH, Developmental History, Item K.
36. Score on NPSDH, Developmental History, Item L.
37. Score on NPSDH, Developmental History, Item M.
38. Score on NPSDH, Developmental History, Item N.
39. Score on NPSDH, Developmental History, Item O.
40. Score on NPSDH, Developmental History, Item P.
41. Score on NPSDH, Developmental History, Item Q.
42. Score on NPSDH, Developmental History, Item R.
43. Score on NPSDH, Home and Family Background, Item A.
44. Score on NPSDH, Home and Family Background, Item C.
45. Score on NPSDH, Home and Family Background, Item E.
46. Score on NPSDH, Home and Family Background, Item H.
47. Score on NPSDH, Home and Family Background, Item K.
48. Score on NPSDH, Health History, Item D.

Note: The variables chosen from the NPSDH for analysis were picked due to their believed subjectivity and relevancy.
APPENDIX E

TABLE 1

ALL SIGNIFICANT (.005 or above) PREDICTOR VARIABLES
GENERATED BY FIRST SAMPLE

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<tr>
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<td>1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 15, 16, 18, 21, 22, 23, 24, 25, 26, 27, 29, 30, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 45, 46, 47, 48.</td>
</tr>
</tbody>
</table>

Note: Variables 20, 33, and 44 were deleted. This omission occurred because variables 20, 33, and 44 contained no variability.
Table II
The Multiple Correlation Values for the Ten Best Predictor Variables Per Criterion Variable Listed Across Samples

<table>
<thead>
<tr>
<th>Criterion Variable</th>
<th>Predictor Variables</th>
<th>Sample 1</th>
<th>Sample 2</th>
<th>Corrected for Shrinkage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1, 7, 13, 16, 17, 21, 28, 34, 37, 40.</td>
<td>.7314</td>
<td>.6313</td>
<td>.4982</td>
</tr>
<tr>
<td>2</td>
<td>1, 3, 11, 17, 23, 25, 35, 38, 39, 41.</td>
<td>.6131</td>
<td>.6060</td>
<td>.4572</td>
</tr>
<tr>
<td>3</td>
<td>3, 4, 10, 11, 21, 22, 23, 25, 37, 43.</td>
<td>.7039</td>
<td>.5647</td>
<td>.3855</td>
</tr>
<tr>
<td>4</td>
<td>3, 5, 8, 10, 12, 22, 23, 24, 27, 31.</td>
<td>.7908</td>
<td>.7974</td>
<td>.7382</td>
</tr>
<tr>
<td>5</td>
<td>1, 2, 5, 12, 13, 22, 29, 30, 36, 45.</td>
<td>.7806</td>
<td>.7235</td>
<td>.6358</td>
</tr>
<tr>
<td>6</td>
<td>4, 6, 11, 18, 19, 25, 30, 37, 38, 43.</td>
<td>.5762</td>
<td>.5772</td>
<td>.4079</td>
</tr>
<tr>
<td>7</td>
<td>1, 6, 8, 10, 15, 16, 22, 29, 38, 40.</td>
<td>.7531</td>
<td>.7366</td>
<td>.6544</td>
</tr>
<tr>
<td>8</td>
<td>1, 6, 7, 12, 13, 22, 23, 29, 40, 43.</td>
<td>.7482</td>
<td>.7528</td>
<td>.6770</td>
</tr>
<tr>
<td>9</td>
<td>2, 3, 5, 6, 12, 22, 23, 25, 29, 40.</td>
<td>.7222</td>
<td>.7970</td>
<td>.7376</td>
</tr>
</tbody>
</table>
A SINGLE COMPARISON OF PARTICULAR PREDICTOR VARIABLES WITH CRITERION VARIABLES, THEIR F-RATIOS AND LEVELS OF CONFIDENCE

<table>
<thead>
<tr>
<th>Criterion Variable</th>
<th>Predictor Variable</th>
<th>F-Ratio</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>4.93</td>
<td>.0321</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>11.76</td>
<td>.0014</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>6.35</td>
<td>.0159</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>5.05</td>
<td>.0302</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>8.23</td>
<td>.0065</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>10.13</td>
<td>.0028</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>4.45</td>
<td>.0412</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>18.09</td>
<td>.0001</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>5.49</td>
<td>.0242</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>11.11</td>
<td>.0019</td>
</tr>
<tr>
<td>8</td>
<td>22</td>
<td>24.22</td>
<td>.0000</td>
</tr>
<tr>
<td>9</td>
<td>22</td>
<td>34.65</td>
<td>.0000</td>
</tr>
</tbody>
</table>
TABLE IV
PARTIAL CORRELATIONS OF INDIVIDUAL PREDICTOR VARIABLES TO CRITERION VARIABLES WITH ALL OTHER NINE PREDICTOR VARIABLES HELD CONSTANT

<table>
<thead>
<tr>
<th>Criterion Variable</th>
<th>Predictor Variable</th>
<th>$r$</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>.3313</td>
<td>.1097</td>
</tr>
<tr>
<td>1</td>
<td>37</td>
<td>.4766</td>
<td>.2272</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>.3701</td>
<td>.1369</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>-.3348</td>
<td>.1121</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>.4131</td>
<td>.1707</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>.4495</td>
<td>.2020</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>.3164</td>
<td>.1001</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>.5581</td>
<td>.3114</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>-.3474</td>
<td>.1207</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>.4662</td>
<td>.2173</td>
</tr>
<tr>
<td>8</td>
<td>22</td>
<td>.6813</td>
<td>.4642</td>
</tr>
<tr>
<td>9</td>
<td>22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE V

CORRELATION COEFFICIENTS FOR THE PREDICTED VALUE OF THE CRITERION VALUE VS. ITS ACTUAL VALUE*

<table>
<thead>
<tr>
<th>Criterion Variable</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-.0299</td>
</tr>
<tr>
<td>2</td>
<td>-.1342</td>
</tr>
<tr>
<td>3</td>
<td>-.2621</td>
</tr>
<tr>
<td>4</td>
<td>.4393**</td>
</tr>
<tr>
<td>5</td>
<td>.5808**</td>
</tr>
<tr>
<td>6</td>
<td>.1321</td>
</tr>
<tr>
<td>7</td>
<td>.4843**</td>
</tr>
<tr>
<td>8</td>
<td>.2943***</td>
</tr>
<tr>
<td>9</td>
<td>.3060***</td>
</tr>
</tbody>
</table>

*This table represents a cross-validation of the prediction equation. Sample 1 prediction equation was cross-validated on sample 2 data.

**Significant at .01 level.

***Significant at .05 level.
**TABLE VI**

*2 X 2 CONTINGENCY TABLE FOR ACTUAL VS. PREDICTED CRITERION VARIABLE FOR NUMBERS SUBTEST OF THE MRT*

<table>
<thead>
<tr>
<th>Sample 1</th>
<th>Actual</th>
<th>Low-Risk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-Risk</strong></td>
<td><strong>Actual</strong></td>
<td><strong>Low-Risk</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>Predicted</td>
<td>6</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10</td>
<td>41</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>(X^2 = 108.1^*)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample 2</th>
<th>Actual</th>
<th>Low-Risk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-Risk</strong></td>
<td><strong>Actual</strong></td>
<td><strong>Low-Risk</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>Predicted</td>
<td>5</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>35</td>
<td>39</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9</td>
<td>42</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>(X^2 = 8.83^*)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant beyond .01 level.*
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