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REGIONAL EVALUATION AND RESEARCH CENTER FOR PROJECT HEAD START, SUPPLEMENTARY RESEARCH REPORT, SEPTEMBER 1, 1967-DECEMBER 31, 1967.

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IN PHASE I (OF THREE) OF A RESEARCH PROJECT, 475 SOUTHERN DISADVANTAGED CHILDREN (RANGING IN AGE FROM 3 TO 6) WERE TESTED IN AN INVESTIGATION INTO THE DESCRIPTION, DEVELOPMENT, AND SEQUENCING OF COGNITIVE ABILITIES DESIGNED TO YIELD INFORMATION ON CHILDREN'S LEARNING WITH IMPLICATIONS FOR TEACHING AND CURRICULUMS. COGNITIVE TASKS WERE SELECTED FROM MORE THAN 50 PUBLISHED MEASURING INSTRUMENTS. TESTERS WERE TRAINED TO AIM FOR A CHILD'S MAXIMUM PERFORMANCE AS THE INVESTIGATORS' OBJECT WAS TO MAKE A CONTINUUM OF PROBLEM SOLVING ABILITIES. DATA WILL BE FACTOR ANALYZED AND A MATRIX OF TETRACHORIC CORRELATION COEFFICIENTS USED. THE RELATIONSHIP OF INDIVIDUAL ITEMS TO THE FACTORS IDENTIFIED WILL BE DETERMINED. IT IS HOPED THAT ITEM SEQUENCING MAY INDICATE A PATTERN OF COGNITIVE DEVELOPMENT WHICH CAN PROVIDE A NATURAL ORDER FOR TEACHING COGNITIVE TRAITS. SEVEN APPENDIXES ARE INCLUDED WHICH GIVE DETAILED INFORMATION ABOUT TESTS AND PROCEDURES. THREE OTHER SUBPOPULATIONS OF CHILDREN WILL BE STUDIED AS PART OF THIS PROJECT. (MS)

SUPPLEMENTARY RESEARCH REPORT

September 1, 1967 - December 31, 1967

REGIONAL EVALUATION AND RESEARCH CENTER FOR PROJECT HEAD START

University of South Carolina

Columbia, South Carolina

Contract No. IED 66-1-11

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Principal Investigator

Submitted

by

Committee on Educational Research

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I. INTRODUCTION

The present document is a supplementary research report to the 1967 Annual Report of the Regional Evaluation and Research Center for Project Head Start at the University of South Carolina. The Evaluation and Research Center was established by subcontract (IED 66-1-11) with the Institute for Educational Development, New York, New York, March 9, 1967. The contract was retroactive to December 1, 1966 and was funded at $108,031.00. In response to a request for additional funds to be used between September and January for the data analysis, the grant was increased to $116,731.00 on October 13, 1967. The present report is a summary of the research activities of the Center with particular emphasis on the work done between September 1, 1967, and December 31, 1967. A review of the research problem area and design as it appeared in the 1967 Annual Report is followed by a description of the data analysis design and procedures.

II. THE RESEARCH PROJECT

Nature of the Problem

The research area identified for investigation by the Regional Evaluation and Research Center for Project Head Start at the University of South Carolina is that of cognitive development in early childhood. Although it certainly cannot be said that research in this area has been neglected in recent years, it is equally true that much work remains to be done. Much of the information that has been gathered exists as unrelated segments in varying contexts. There, for example, is no dependable pre-school academic achievement test. There are still problems with respect to the relationship between cognitive "readiness" and teaching/testing procedures. Apparently there is a need for an investigation of the whole problem of cognitive "readiness" in early childhood in which a schema is developed for organizing cognitive performance into meaningful elements with reference points for both testing and teaching.

In an effort to focus an extensive research endeavor into this area, the Committee on Educational Research, with the assistance of various consultants, has designed and implemented an investigation into the description, development, and sequencing of cognitive abilities. Cognitive skills have been defined by the present investigators as the ability of a child to solve problems in response to verbal instructions. As the definition limits the research to children of at least three years old, it will be expanded at a later point in the investigation to include younger children.

Statement of the Problem

The present investigation was designed to provide extensive descriptions of the development of cognitive skills in young children, and to relate these skills (in terms of discrete traits and sequences of development) to define sub-populations of the United States. When the resulting profile has been tested across sub-populations, the first phase of the investigation will be complete. This phase of the research is expected to yield the following:

1. A more precise description of the "universals" in cognitive development--discrete traits and sequences of development that emerge.

2. A more specific and extensive description of cognitive development in given sub-populations of the United States than is presently available for any population.

In the Phases II and III of the investigation, teaching methodologies will be related to the profile and the profile will be utilized in the diagnosis and treatment of problems in cognitive development. The latter Phases of the project will not be discussed in the present document; the design is not finalized and only Phase I is funded.

Significance of the Problem

Research endeavors in child growth and development in recent decades, especially those of Benjamin Bloom, have amassed evidence to substantiate that the first five years of life are of prime importance in cognitive development. Unfortunately, these early years appear to be the most mysterious and evasive with respect

to modes of learning. That is to say, learning during this period seems to be less accessible to investigation than that of later years, and as a result an understanding of the manner in which learning occurs is quite limited.

As there appears to be little confidence among educators today in either theory or method with respect to early cognitive development, the Committee on Educational Research, University of South Carolina, believes the area to be a fruitful one for discovery and contribution. Given the problem area and the research design to be followed, the present investigation is on-going and funnel-like in its attempt to begin with a general problem and move ever closer to a more precise understanding of cognitive phenomena. The research is expected to generate hypotheses from which the direction of future and/or periphery research will follow logically. Whatever the findings, the data are expected to yield implications for teaching and curriculum for a better understanding of the way in which children learn. This will be particularly true of specified sub-populations among which are the "disadvantaged."

Design of the Investigation

The Research Model. The development of a conceptual model for the investigation consisted of relating three general elements into an overall research design. The first of these elements was the location and assembly of a large number and variety of tasks or problems which required cognitive skills to perform. The second was the identification of sub-populations of children from

different cultural backgrounds and of various ages. The third element was a method of relating and analyzing the performance on each of the cognitive tasks of the several populations of children. Since the two important dimensions of the investigation are trait and developmental sequence, the data model for the investigation became a two-dimensional matrix of task descriptions, the horizontal axis representing categories or discrete types of problems (cognitive traits) and the vertical axis representing the sequence in which children are presently able to perform the tasks (in other words, easy to difficult). No prior suppositions were made regarding which traits exist or in what order different skills develop. In effect, children of given populations are presented with a great variety of problems; the correct and incorrect responses of the children then are analyzed to place the problem descriptions in an array according to (1) similarities and differences and (2) sequences of development.

The research model is inductive in that it takes as its point of departure the presentation of problems to children and the analyses of their responses to them rather than beginning with the testing of a theory of behavior. It is convergent in that it is not planned to test one or more hypotheses but rather to address a general problem through successive states of closer approximation. Critical aspects of the model are the selection of subpopulations, the identification of cognitive tasks, and the development of analysis procedures.

The Selection of Subjects. Four sub-populations from within the total population of the United States were selected for the inves-

tigation. These included: disadvantaged children (as defined by the Office of Economic Opportunity index) in the South, advantaged children (annual family income from $6,000 to $15,000) in the South, disadvantaged children (as defined by the Office of Economic Opportunity) in the North and advantaged children (annual family income from $8,000 to $17,000) in the North.

The investigators reasoned that these four sub-populations within the nation would define useful limits in generalizing to other sub-populations across the country. The decision was made that the order of the investigation would be, first southern disadvantaged, then southern advantaged, followed by northern disadvantaged and northern advantaged. Because of the fact that the year was well advanced at the time of the Evaluation and Research Center's establishment, only the data on the first of these populations could be gathered prior to August 31, 1967.

The sample for the southern disadvantaged sub-population was drawn from disadvantaged children attending Head Start programs in metropolitan areas of South Carolina. The sample group of 475 children was selected from four geographic areas (Columbia, Florence, Charleston, and Sumter) with the following distribution across ages: six-year olds, 147; five-year olds, 152; four-year olds, 143; and three-year olds, 33.

The Selection of Cognitive Tasks. An initial step in the implementation of the research design was that of identifying a body of cognitive tasks for presentation to the subjects. The present investigators believed that the most effective way of accomplishing

this would be to identify published instruments that are persumed to measure cognitive abilities. These instruments could serve as the source of cognitive tasks if the group of tests were large enough in number and variety and if each item of each test was viewed independently. The procedure would require modifications in administration and scoring but it offers a fruitful source from which to obtain cognitive tasks.

Proceeding on this rationale, the Evaluation and Research Center staff assembled copies of more than fifty published tests as well as curriculum materials that could be used as testing materials. These instruments and materials were carefully screened to assure that (1) task directions were either available or could be written for the child, (2) the child's ability to complete tasks could be identified within the limits of measurement error, and (3) the performance of the tasks required cognitive functioning or problem-solving ability.

Next, in order to ensure that the tests finally selected would sample from a bread range of cognitive abilities, an outline of skills apparently required by the various tests--item by item--was prepared (see Appendix A). Six major categories were derived, each comprised of specific problem-solving abilities. Each item in every test was coded on the basis of this outline in terms of the specific cognitive or problem-solving ability that it appeared to elicit. The coded tests then were examined and final selection was made on the basis of (1) a broad, representative distribution of various task types and (2) a stratified sampling according to task levels of difficulty. The tests finally selected for inclu-

sion in the investigation are listed with publishers in Appendix B.

As it was not feasible to administer all tests to all 475 children in the sample, the tests were arranged in four batteries on the basis of approximately equal time required to administer the battery and a broad range of skills required within each battery. As all subjects would not be administered all tests, it was necessary to select common or "anchor" tests that would be administered to all subjects in order to have a basis upon which items in different batteries could be related. The Stanford-Binet Scale (1960) and the Wechsler Preschool and Primary Scale of Intelligence (1966), together with selected color items from the Pre-School Inventory Test (Caldwell-Soule, 1965), were chosen as the "anchor" tests. The complete schedule of tests administered, according to batteries, appears in Appendix C.

The Training of Testers. In view of the nature of the research and the fact that extensive modifications were to be made in the administration and scoring of the tests in each battery, the training of field testers was of crucial importance to the investigation. The use of the tests was unique in that it was aimed at assessing the continum of problem-solving abilities in young children rather than merely measuring performance against the vague concept of "normal" behavior. The alterations in the administration of the items were designed to obtain a measure of the "maximum performance" of the child.

For example, the administration of the Stanford-Binet was quite different from the published standards. All items through

Year VII were presented unless in the examiner's opinion further questioning would be detrimental to the testing situation. Further, all items were administered with intensive probing so long as no alteration in the substance or intent of the item resulted and so long as no clues were given to the correct response. Also, no arbitrary limits of time or number of trials were imposed on the child for any item.

Obviously, the derivation of an I. Q. score from such data would be extremely hazardous because an over-estimate would surely result. But data on problem-solving abilities obtained in this fashion should prove to be particularly relevant to the present research design. (A complete description of the probing rationale and procedures is presented in Appendix D.)

Therefore, the training of field testers to administer the batteries was planned and conducted with extreme care. During the first week of the training sessions, examiners were instructed in the specific modifications of each test as well as the standard directions provided by the tests' publishers. Initial training also included the examiners' testing each other in role-playing situations during which time specific problem areas were identified and observed. The purpose of the first week's training was to orient examiners to the tests they were to administer, to uncover problems, and to provide answers to procedural questions.

In the second week of training, the examiners practiced the tests they were to administer with children as subjects. The Center staff arranged to bring in children from a local Head Start Center to act as subjects inasmuch as they were similar to the

children the examiners were to encounter in the field.

The final days of the training sessions were devoted to both specific and general problem areas discovered during the practice sessions. Related discussions resulted in the examiners' better understanding both of their roles as testers in the research project and the importance of quality control to the reliability of the data.

A detailed listing of testing controls was designed to maximize the validity of the data and the uniformity of the testing conditions. During the course of the examiners' practice testing and in the first days in the field, additions and modifications or the original controls were necessary. The final revision appears in Appendix E. In addition, a listing of all persons participating in the research project, with professional training and research responsibilities, is presented in Appendix F.

Testing Procedures. Administration of tests in the field began the week of June 19, 1967, and complete data from the population of southern disadvantaged had been collected by August 31, 1967. The 475 children comprising the sample were divided into five groups. Each of the first four groups was made up of one-third four-year olds, one-third five-year olds, and one-third six-year olds. In each of these groups, there were approximately 110 subjects. These four groups were administered respectively test Batteries I through IV. The fifth group was composed of approximately 30 three-year olds, and this group was administered a special group of tests selected from across the four batteries.

In order to control performance variations due to differences

In the order in which the tests were administered, all subjects received the "anchor" tests first. In the case of the other six tests in each battery, the groups of 110 subjects were divided equally into two sections. One half was administered the tests in the battery in the order 1, 2, 3, 4, 5, 6, and the other half was given the tests in reverse order, 6, 5, 4, 3, 2, 1.

A number of procedures were developed and utilized to insure the quality of the data collected. First, each test administrator was observed frequently and at different stages in the testing process (beginning, middle, end of session). The tester's performance was rated and recorded through the use of a tester evaluation instrument (see Appendix G). In addition, tape recordings were made of actual testing sessions. By means of these devices and others, a constant monitoring of data quality was conducted.

III. DESIGN OF THE DATA ANALYSIS

The initial data analysis has been concentrated on the Stanford-Binet and the WPPSI. These were the first data collected, checked and recorded. It is appropriate to utilize these data first in order to set up factors on a large body of data and relate the remaining data to these factors.

One assumption basic to the present research is that cognitive skills develop in some sequential manner; the investigators expect to shed some light on the nature of this development by the manipulation of test items. If items have a factor or trait in common and the postulated developmental sequence is a real phenomenon, then children should show advances in some orderly fashion in their responses to items associated with a particular trait or factor. In other words, if trait items can be scaled on difficulty then a child should be able to answer successfully item one before item two. There are approximately 360 items on the Stanford-Binet and WPPSI (as administered in the present study) which have been administered to some 470 subjects. The answers have been recorded as Pass, Fail or No Response. Answers were recorded as No Response if the child did not attempt to respond to the item or if the tester omitted the item to maintain rapport after determining that the item was definitely beyond the ability of the subject being tested.

The initial problem of the analysis was to segregate the 360 items into groups based upon the interrelationships among items.

Although many schemes of grouping might be feasible (e.g., by content, by type of response, by type of stimuli, etc.) the factor analysis technique appears to be consistent with the conceptual design of the present study.

Dr. R. Darrell Bock of the Department of Education, University of Chicago and Dr. Fumiko Samejima of the Psychology Department, University of North Carolina, have suggested that a matrix of tetrachoric correlation coefficients should be used and corrected for guessing. For each item in which there was a chance that the child gave a correct response by guessing, a chance correction factor was calculated. The method of correcting a matrix of tetrachoric correlation coefficients is given in an article by John B. Carroll which appeared in Psychometrika, Vol. 10, No. 1, March, 1945. The No Response category presented special problems as the correction is applied only to the proportion of subjects attempting the item. Therefore, a modification of Carroll's technique was required. To illustrate, suppose that of one hundred children, seventy-five responded to a given item and twenty-five did not. Only the proportion of correct responses should be adjusted. Suppose that fifty were right and twenty-five were wrong and that the item has a forty percent chance of being guessed (c = .40). It is assumed that some of the fifty correct responses were guessed so that the adjusted proportion correct is (50-25)/100 = .25. A correction for guessing adjusts the proportion of Rights in a downward direction. The computation will not reflect the twenty-five Wrong responses or the twenty-five No Responses. In the present study the correlation coefficient for each item was adjusted in this manner.

Items of either very high or very low difficulty were eliminated from the analysis since so little variability in the response exists that these items would not contribute to the analysis. Under this restriction the matrix of tetrachoric correlation coefficients is somewhat less than 360 X 360.

Programs at the local computer facility cannot handle a matrix of this size nor do they have computation of the tetrachoric correlation coefficient as an optional feature. Therefore a program written by Roald Buhler of Educational Testing Service had to be modified to take into account the three classifications of responses (Right, Wrong, No Response) used in the present study.

As a 360-item matrix cannot be accommodated by the existing programs, Dr. Samejima suggests that this limitation can be circumvented by obtaining a set of approximately fifty items of "middle difficulty" after correction--that is, items approximately of a fifty percent difficulty index. This procedure will leave about 300 items which will be divided into six sets of fifty items each, such that each set has about the same range of difficulty. Each of these sets of fifty items will be combined with the originel set of fifty middle difficulty items to form six sets of 100 items of which fifty items are common to each set. These six groups will be used to perform factor analysis on the matrix of correlation coefficients for each group.

The rationale for this procedure stems from the fact that the standard error of the tetrachoric correlation coefficient is minimized when the two items being correlated lie in the middle difficulty range. Setting up an analysis in which the majority of the

correlations are based upon pairs of items of which at least one item lies in the middle difficulty range will produce matrices with greater inherent stability than would result if both items of a correlated pair lay at a more extreme limit of difficulty. The ultimate factor structure will reflect the stability of the tetrachoric correlation coefficients utilized to generate the factors.

It is expected that the matrices of factor loadings based upon the first six sets of 100 items will approximate a simple factor structure; the items that load highest on each factor will be identified. Once the initial six analyses have been completed, the problem then becomes one of relating the factors generated. The factors derived from these six analyses will be combined to reduce the number of factors. In the factors so derived, the items common to each of the six sets will group in some consistent fashion and reduce the total number of factors established from the first six analyses. The reduced number of factors must still be related to one another in some meaningful fashion. The factors identified from the first analyses will be related in a logical, though subjective, pattern. The theoretical assumptions underlying the sub-factoring of the original matrix have not been empirically validated for an undertaking of this magnitude. It is necessary to cross-validate the efficacy of the present procedure. Two methods of validation are at our disposal: (1) Factor analyze on a larger scale--that is, use facilities that will perform the first step with two or three larger groups instead of the original six groups of 100 items--to check our procedures. The more

extensive computer facilities of the Research Triangle in North Carolina are capable of handling matrices of these dimensions. Cooperation with that agency has been established for further analysis, (2) Items grouped as a result of the first (six set) factor analysis can be analyzed by a technique developed by K. G. Joreskog, in which one obtains a test of whether or not the items involved are common to a single factor. If this be the case, the assumption of a single underlying dimension within the grouped items is warranted.

At this point groups of items on the WPPSI and Stanford-Binet will identify factors. The problem will remain of relating some additional 350-450 items from the individual batteries to the factors identified. In a manner yet to be determined each of the battery items will be investigated and a measure of the relationship between factor and item will be established. The Joreskog factor analysis will provide factor loadings which will be used to scale the items comprising each factor. Two parameters are involved in each item: (1) one associated with the ease or difficulty of the item (assessed by the adjusted proportion correct) and (2) the discriminating power of the item (associated with the factor loadings in the single factor test of Joreskog).

Assuming a normal ogive relationship between the curve of item characteristics and the underlying trait, each item can be scaled by using the parameters of difficulty and discrimination. From this patterning of items will come whatever implications that exist within this study for education. (Subjectivity admittedly exists within the present study. This step may be the most

subjective and at the same time the most fruitful step within the study.) The sequencing of items may indicate a stable pattern of development and hold a natural order for teaching the cognitive traits represented by the items from which the data derived.

IV. Appendices

Appendix A

Item Classification Outline

ITEM CLASSIFICATION

OUTLINE

I. **PERFORMANCE** - Ideally includes items that require motor skill and that are scored for motor coordination or level of physical maturity only.

1. Action Items - examples: jump! stand with your toes pointed out. - also includes items that require following directions - ex: put the pencil on the chair.
2. Block Building - Ex: the child is asked to build a pyramid and has a model to go by.
3. Object Assembly - This is not like the subtest object assembly on the Stanford-Binet which would fall under IV - 2 (Spatial, mazes and puzzles) on this classification. Object assembly here refers to stringing beads and other similar items that emphasize manual dexterity. (ex: pegboards)
4. Taxonomies - sorting tasks

II. A. Verbal - includes items that require the child to speak and exhibit some verbal skill. Yes and No answers would not be included.

1. Vocabulary

a) picture identification - items which require the child to attach a name and/or story to a picture.

b) object identification - requires the child to attach a name to an object.

c) definition or word meaning - requires the child to verbally define a word.

d) talking - some tests include a very general score on child's chatter throughout the test.

2. Comprehension

a) analogies - includes items which require the child to supply a missing word. Ex: Summer is hot; winter is _____. Though some of these may be opposites they are included.

b) similarities and differences - items requiring child to explain how things are alike or different. Ex: How are a peach and a ball alike? How are they different?

c) interpretation - includes items that require a child to explain the meaning of a statement, proverb, etc.

d) explanation - requires a child to explain or untangle a sentence or phrase. Ex: What's foolish about this sentence?

3. General Knowledge - Items asking for personal-social information (when is your birthday?) or well known events (what do we celebrate on the 4th of July?) or facts (what is the color of a ruby?)

B. Non-Verbal - This category covers approximately the same areas as II-A (Verbal) but items included here generally do not require the child to speak.

1. Vocabulary

   a) picture identification - items in which the tester gives a word and the child points to or marks the correct picture.

   b) object identification - same as above except the child chooses among objects placed before him.

2. Comprehension - This is a broad category containing items that are intended to evaluate the child's understanding of a situation, picture, object, etc. Although he may be required to give a verbal answer to some of the items, these answers aren't scored for the adequacy of vocabulary but conveyance of some central concept. This category also includes some items referring to time concepts, depending on the form of the item.

   a) picture stories - requires the child to indicate in some way what is happening in a picture.

   b) indicate use for _____ - includes items which present the child with an object or picture and requires him to indicate in some manner what one does with it. Ex's: Item - picture of a saw; Response - a sawing motion. Item - a small cup; Response - child pretends to drink.

3. Picture, Color or Object Recognition - This, too, is a broad category, including a wide range of items probably requiring a number of skills. First, items

which require the child to find a similarity or difference in pictures or objects; this differs from taxonomical items (also falling in this category) in that it is more complex and requires more than simple grouping. Ex: Item - picture of large ship (find one like this); Response - child chooses among variety of objects a small peculiar boat.

Taxonomies, here, include grouping by color, use, etc. This category also includes mutilated picture items and the child must point out the inconsistency.

4. General Knowledge

   a) Ex: pictures of sun, orange and football - "Take the yellow crayon (tester gives child the correct crayon) and color the one that should be yellow.

   b) pictures of car, bicycle and top - "Mark the one that is most expensive."

5. a) symbol identification - recognition of letters

   Ex: Mark one

   F || S T (F) K

   b) phonetics

   Ex: picture of ball, light and tree - "Mark the picture that starts with the same sound as boat."

6. Sequencing - Items here are mainly picture stories cut into 3 or more stages and child must arrange these in the correct order. Some are reversible. One item

shows a child building a tower if done one way, and taking it down if done another. In this case the child must specify what is happening. Some items that are set up as sequences fall under IV-6, or 7 (Spatial Projection or relationships)

III. NUMERICAL - This category should not include items such as, "How many pennies in a nickel?" which fall under Verbal, General Knowledge, but items which require only a knowledge of numbers and number concepts.

1. a) number - symbol identification - items which require knowledge of printed number symbols (1, 2, 3, etc.)

   b) number identification - (should probably be under counting) - items which demand knowledge of names and numbers. Ex: Tester holds up 3 fingers and asks, "How many is this?"

2. Number Manipulation - direct addition, subtraction, etc. Ex: 2 + 2 is how many? There are few items of this type.

3. Numerical Reasoning - Number problems which require number manipulation. Ex: If one pencil costs 3 cents, how much would two pencils cost?

4. Counting - counting aloud, handing tester a certain number of objects or marking the picture with the correct number of items.

5. Number Concepts - Items which test for the idea of relationships such as more, fewer, half as much, etc.

(some confusing items here - Ex: picture of a whole sandwich, then three pictures of same sandwich (1) cut in half, (2) cut in thirds, (3) cut in fourths. Question - how will this sandwich look when it is cut once?) - Is this a number concept or is it spatial? (These items were classified as number concepts.)

IV. SPATIAL - This category contains many items that are usually grouped under Performance. They are included here when the concepts involve more than physical maturity, muscle coordination or speed.

1. Block Design and Patterning - This is not block building, but arrangement according to some precise pattern where the only guide is a pattern without block division. Items that require the completion of a pattern by choosing a matching piece. Items that require the cutting or folding of paper to match a demonstration model.
2. Mazes and Puzzles - This category includes all mazes - paper and pencil, wood, etc. It also includes puzzles of the jigsaw type, puzzles that have only one missing piece, formboards, or disentangling two fitted pieces (paper-clip type).
3. Taxonomies - classification according to form, size, arrangement, etc. - not usage or color.
4. Copying of Forms - requires child to copy different geometric forms
5. Drawing - includes drawing objects or people without a model. (4) could be included under Performance,

but (5) is relatively independent of drawing skill and focuses on inclusion of detail, with relatively no emphasis on how well the object is drawn.)

6. Projection - requires knowledge of behavior of objects in space. Ex: Jar half filled with colored water standing upright - Task: How will the water look if the jar is tilted (demonstrate with empty jar). The child is given a picture of a tilted jar and asked to draw the water in it.

7. Relationships - items which ask which is farther or nearer to X, with pictures graded in size. Which is larger - smaller? Which mouse is too large to go through this hole?

8. Picture Completion (Closure) - items which require the child to identify or finish drawing an incomplete form or picture.

V. MEMORY

1. Auditory Retention

a) verbal - includes items which require the child to carry out an extended series of instruction, to repeat a sentence or phrase or to answer questions about a story which he has been read (or to retell the story).

b) numerical - items which require child to repeat a series of numbers either as they were called out or backward.

2. <u>Visual Retention</u> - items which require the child to repeat words, numbers or letters that he has seen. Items that require the child to draw a form which he has been shown briefly - or items that require the child to imitate an action.

Appendix B

Tests and Publishers

TESTS AND PUBLISHERS

Arthur Adaptation of Leiter International Performance Scale (1948)

Published by: C. H. Stoelting Company
424 North Homan Avenue
Chicago 24, Illinois

Arthur Point Scale of Performance Test (1947)

Published by: Psychological Corporation
304 East 45th Street
New York, New York

Caldwell-Soule Pre-School Inventory Test (1965)

Published by: State University of New York
Children's Center
Department of Pediatrics
Upstate Medical Center
Syracuse, New York

Columbia Mental Maturity Scale (1959)

Published by: Harcourt, Brace and World, Inc.
757 Third Avenue
New York, New York 10017

FROSTIG Developmental Test of Visual Perception (1961)

Published by: Consulting Psychologists Press
577 College Avenue
Palo Alto, California

Goodenough Test (1963)

Published by: Harcourt, Brace and World, Inc.
757 Third Avenue
New York, New York 10017

Illinois Test of Psycho-linguistic Abilities (1961)

Published by: University of Illinois Press
Urbana, Illinois

TESTS AND PUBLISHERS--Continued

IPAT Culture Free Intelligence Test (1950)

Published by: Institute for Personality and Ability Testing
1602 Coronado Drive
Champaign, Illinois

Let's Look at First Graders: A Guide to Understanding and Fostering Intellectual Development in Young Children

Published by: Distributive Services
Cooperative Test Division
Educational Testing Service
Princeton, New Jersey 08540

Merrill-Palmer Scale (1931)

Published by: C. H. Stoelting Company
424 North Homan Avenue
Chicago 24, Illinois

Metropolitan Readiness Test (1943)

Published by: Harcourt, Brace and World, Inc.
757 Third Avenue
New York, New York 10017

Minnesota Preschool Scale (1940)

Published by: Educational Test Bureau
720 Washington Avenue, S. E.
Minneapolis 14, Minnesota

(The) Oseretsky Tests of Motor Proficiency (1946)

Published by: Educational Test Bureau
720 Washington Avenue, S. E.
Minneapolis 14, Minnesota

TESTS AND PUBLISHERS--Continued

Peabody Picture Vocabulary Test (1959)

Published by: American Guidance Service, Inc.
Publishers' Building
Circle Pines, Minnesota

Raven Children's Colored Progressive Matrices (1951)

Published by: West Psychological Services
12035 Wilshire Boulevard
Los Angeles, California 90025

Stanford-Binet Test (1960)

Published by: Houghton-Mifflin Company
3108 Piedmont Road, N. E.
Atlanta, Georgia

Tests of Science Research Associates Primary Mental Abilities (1953)

Published by: Science Research Associates
259 East Erie Street
Chicago, Illinois

Winter Haven Test for Preschoolers (1967)

Published by: Winter Haven Lions Publication Committee
Post Office Box 1045
Winter Haven, Florida

Wechsler Preschool and Primary Scale of Intelligence (WPPSI) (1966)

Published by: Psychological Corporation
304 East 45th Street
New York, New York

Appendix C

Schedule of Research Tests Administered

SCHEDULE OF RESEARCH TESTS ADMINISTERED

Anchor Tests: Stanford-Binet Intelligence Scale (1960)

Wechsler Preschool and Primary Scale of Intelligence (1966)

Battery I: SRA Primary Mental Abilities (1953)

Preschool Inventory, Caldwell and Soule (1965)

Frostig Developmental Test of Visual Perception (1961)

Columbia Mental Maturity Scale (1959)

Let's Look at First Graders (adapted for research purposes) (logical reasoning)

Battery II: Illinois Test of Psycholinguistic Abilities (1961)

Raven Progressive Matrices for Children (1951)

Winterhaven Perceptual Forms (1967)

Let's Look at First Graders (Mathematics)

Battery III: Minnesota Preschool Scale (1940)

Merrill Palmer Scale (1931)

Arthur Point Scale of Performance Tests (1947)

Arthur Adaptation of Leiter International Performance Scale (1948)

Let's Look at First Graders (time concepts)

Battery IV: Metropolitan Readiness Test (1943)

Culture Free Intelligence Test (1950)

Peabody Picture Vocabulary (1959)

Goodenough-Harris Drawing Test (1963)

Let's Look at First Graders (Spatial relations)

Oseretsky Tests of Motor Proficiency

Appendix D

Probing, Rational, and Procedures

PROBING, RATIONAL, AND PROCEDURES

The Committee on Educational Research, University of South Carolina, is currently conducting research in the area of cognitive development. The purpose of this research is threefold. (1) The construction of a sequential scale of cognitive development - a scale which delimits problem solving abilities and the stages of development within these abilities. (2) The relation of teaching methodology to the sequential scale and (3) the eventual diagnosis and treatment of problems in cognitive development by means of instructional programs derived in (2).

In order to execute the construction of the developmental profile, the Committee assembled four batteries of tests, each battery consisting of two anchor tests - - the Stanford-Binet and the Wechsler Preschool and Primary Scale of Intelligence - - and a balanced body of tests tapping problem-solving abilities. Except for the anchor tests, each battery was different from every other battery in composition, but very nearly the same in content. That is, each battery contained different tests designed to measure perceptual-motor ability, verbal ability, etc. Every child in each population sampled would be administered one complete battery.

For the development of the profile the committee was not interested in a child's response to a question or demand but in whether or not a child could successfully perform a task, or solve a problem when he knew what was expected of him and had sufficient time in which to perform. A test item administered with standardized manual instructions

is obviously insufficient for this purpose. It was decided, therefore, that each test was to be administered in the following fashion:

1) All items (above and below manual indicated limits) would be given to every child so long as rapport could be maintained and the child kept from distress;

2) All items would be administered with intensive and appropriate probing;

3) No limits would be imposed, neither time limits nor number of trials; and

4) Cut-off criteria would depend upon the tolerance of the individual child.

In order to place items along a reliable continuum of difficulty, it was necessary that all items within each test be administered to all the children. For example, on the Stanford-Binet all items from year II through year VII were administered to each four, five and six year old; three year olds were given a more limited battery. For such a task the tester must be expert in rapport techniques, relate well with the population under study, and be sensitive to the slightest change in the child's behavior. A child faced with constant failure, as many would be under such a barrage, is easily lost and difficult to recapture. The tester must be able to extract all that the child has to give without demanding so much that the child withdraws from the testing situation.

No item carries definite trial or time limits. The ability to solve a problem does not, for current purposes, incorporate the amount of effort required to solve it. The tester does record, however, the number of trials or the length of time required for a task. Such information is more useful for analysis and diagnosis than that obtained by imposed limits.

In most instances specific cut-off criteria, i.e., conditions requiring termination of testing, are left to the judgment of the tester. This is not an arbitrary decision, however. Testing is terminated for subtests composed of items ordered according to difficulty level only when, in the tester's opinion, further questioning would be definitely detrimental to the testing situation, i.e., loss of rapport or withdrawal of child. If the items are not increasingly difficult, testing is terminated only temporarily, or broken by some pleasurable task with which the tester may draw the child back into the test.

Probing is the fundamental element of the maximum performance approach. Without probing there is no assurance that the child has answered the particular question which he was asked, or that he has understood the particular task to be performed. True, these may be indications of ability, but such results are not very helpful in the construction of a developmental profile. Appropriate probing refers to the elicitation of the best response the child is capable of making without losing or altering the intent of the item and without cueing the answer. All probing must be recorded in the test booklet. The child's responses are recorded verbatim.

Since the content of the probing must differ from child to child, the "standardized" instructions which may be given with each item are limited. Valid results can best be obtained by standardizing the training of the testers. The tester must understand the content of each item and the limits to which he may go in eliciting a response. He should be familiar with the purposes of the testing and the way

in which the results are to be used, and he must be well acquainted with the population with which he will be working.

The Committee on Educational Research found the following training program highly effective in producing competent testers:

1. Each tester is given his materials to be learned item by item.

2. Each tester is instructed in rapport techniques and general problems of the testing situation.

3. An instructor goes over each test item by item with a small group of testers, explaining the content of each item which requires pre-determined definitions, the possible responses, the desired response, and the acceptable means of obtaining such a response.

4. The instructor demonstrates the test for a small group of testers on a subject drawn from the population to be tested.

5. Testers administer the tests to each other, friends, relatives, etc., until they no longer require the manual.

6. Testers administer tests to members of the population to be studied. All testing is done with continual supervision. After each testing session, time is reserved for critical evaluation of testing techniques and for questions. This schedule of testing and evaluation of the tester is continued until the tester receives a perfect score on the rating scale.

Each tester is rated by at least three persons (observers) well acquainted with the tests and experienced in their administration. The observer remains in the room throughout the testing period.

7. The tester goes into the field, or into actual testing conditions, and tests a fraction of the sample set aside for this purpose. Supervision or observation of the tester is reduced to two thirty-minute observation periods per six hour day. These data are not

used in later analyses.

8. The training is completed, but two observation periods per week of thirty minutes each are continued throughout the testing in order to maintain consistency across testers in probing techniques and to prevent the stabilization of peculiarities testers are prone to develop. Meetings of testers are called at regular intervals to discuss the results of observations which include evaluations recorded on the rating scale, the administration of individual items, scoring, etc.

SAMPLE ITEMS

EXAMPLE:

Initial Population: Southern deprived children, White and Negro, Ages three to six in Headstart programs in South Carolina

Items and Probe Questions

WPPSI - Wechsler Preschool and Primary Scale of Intelligence

1. Information subtest

   Item 14

Q. (as in Manual) What must you do to make water boil?

A. (as in Manual) Put it on the stove -- heat -- put fire under it -- cook it.

   Intent: The intent of this question (for the purposes described) is to ascertain whether or not the child knows that heat is required in order to boil water. If no response (or unacceptable response) is obtained then probing is required.

Acceptable probing: in order of progressive failure

a) if you had some water and wanted it to boil, what would you do?

   N R *

b) if I had a pot and put water in it and wanted it to boil, then what would I have to do?

Unacceptable probing: anything suggesting heat

a) what would happen if you put it on the stove?

b) must you make it hot? etc.

Acceptable answers: anything suggesting heat.

2. Vocabulary subtest (probing with intent to break a set)

---

* No Response

Q. What is a shoe? (manual)

A. Made of cloth, points to shoe. (acceptable)

Q. What is a knife? (manual)

A. Made of metal (acceptable)

Q. What is a bicycle? (manual)

A. Made of metal (not acceptable, but child has formed a set and feeding further vocabular items into this set would result in fallaciously low score).

Probing: Examiner: Yes, it is made of metal, but what is it?

A: It's some rubber, too.

Examiner: That's right, Roy, but what do you do with a bicycle. What's it for? Do you have a bicycle at home? What do you do with it? Probing is designed to break the set of describing an item in terms of its components.

3. Picture Completion subtest

The manual permits no variation from the word missing. i.e. See this picture. Some important part is missing. Tell me what is missing. The intent of this subtest is obviously not to measure the child's ability to interpret the word "missing." Though most children catch on quickly, this is sometimes a problem.

Acceptable probing revolves around wording.

Example:

a) See this picture, something is gone, something is not there, tell me what it is.

b) See this wagon. This wagon needs something. Tell me what this wagon needs.

Unacceptable probing contains cues.

Example: See this wagon. This wagon won't roll right - What does it need to roll?

4. Comprehension subtest

Item 3

Q. What is the thing to do when you cut your finger? (manual)

Intent - to promote healing, prevent infection

A. Hurt

Acceptable probing: Yes, I know it hurts, but what do you do to your finger after it is cut and hurt?

A. Suck it.

Q. O.K. But why do you suck it?

Unacceptable probing:

Q. What do you put on the cut? What do you do to it to make it get well?

Stanford-Binet Intelligence Scale

Year IV

Item 3 Opposite analogies

Manual procedure: Say:

"Brother is a boy; sister is a ---------."

Acceptable probing

You know what a brother is, don't you? Brother is a boy, and you know what a sister is - Sister is a ----------(child must finish sentence not answer question).

Unacceptable probing

Is sister a boy? Then what is sister? Though this may not change

the item appreciably - it is no longer an analogy and therefore unacceptable.

Year VI Item 2 Differences

(Manual) Procedure: Say:

"What is the difference between -----"

(A bird and a dog?)

Acceptable probing: You know what a bird is and you know what a dog is. Tell me how the bird and the dog are not alike.

Unacceptable probing: A bird flies, doesn't it? Does a dog fly? etc.

Caldwell Preschool Inventory

Item 43

Q. What does a dentist do?

A. Gives you money.

Acceptable probing: Is your daddy a dentist? (in which case response is not unreasonable) What else does a dentist do?

A. Hurts you.

Q. How does he hurt you? What is it that he does to you?

Unacceptable probing:

Q. Why does he look in your mouth?

Every task presented to the child must be explained until the child understands or rapport is threatened.

Ex: From Developmental Test of Visual Perception by Marianne Frostig

Item IIa-1 The child is required to outline a triangle within a square. A large demonstration card provides the tester with a triangle. The tester shows the triangle to the child saying: "See this shape. It is called a triangle. Look at it carefully. (Tester outlines shape

with his finger) See what I'm doing - now, you do it. Put your finger here and go over the lines. Good! Now, let's do it with a crayon. (If the child colors the triangle). No, you filled the triangle with red. We only want to color the lines of the triangle - see, this line and this line and this line. (Selects contrasting color) Now, take this crayon and color the lines of the triangle, just the lines."

Instruction is continued until child performs the task correctly or until rapport is threatened. Since this is a test of visual perception, teaching the item by over instruction is no problem.

On materials which require only a pointed finger or the indication of a choice (ex: show me the one that is different) probing is used to break sets (such as always pointing to the upper left hand corner) to slow a child down or to explain the task as often as necessary.

Example of over-probing:

Probing too much is just as ineffective as probing too little. When an item is obviously beyond the grasp of a child, repeated probing is useless and harmful.

Example: Stanford-Binet

Year VII Comprehension III

Q. What would you do if you were in a strange city and someone asked you how to find a certain address?

A. I'd buy one.

Q. All right, Sue, listen again, this is a hard one, so listen very closely and see if you can answer it.....Examiner repeats Q.

A. I don't know.

Q. I'm sure you know - if you were in a town you had never been in before and someone asked you how to get somewhere what would you

tell them?

A. Go to town.

Q. Examiner again rephrases question.

When the examiner continues probing on items beyond the child's comprehension, the child becomes frustrated and angry or withdraws. Overprobing is a waste of time and places unnecessary strain on both child and tester. Overprobing on one or two items may invalidate test results for an entire test since the child loses interest in the test and rapport with the tester.

Another pitfall of probing is the tendency it creates in a tester to teach. It is easy to mistake teaching for probing. Appropriate probing never contains cues to the correct answer.

Example of Teaching:

WPPSI - Similarities subtest

Q. How are a coat and a sweater alike?

A. No response.

Q. You know what a coat is. What do you do with a coat?

A. Put on.

Q. Right! You put it on, don't you? Well, what do you do with a sweater?

A. Put on. (response practically guaranteed by previous enthusiastic reinforcement).

Q. Good! So what is it that you can do with both a sweater and a coat?

A. Put on.

The final response is one which would be scored correct, but whether or not the child has answered the question is dubious. He may have simply been taught what to say.

The line between probing and overprobing or teaching is fine. It may be drawn only as one understands every item on every test, for it

varies from item to item and from test to test, depending upon the type of test, the task to be performed and the wording of the item.

Appendix E

Controls for Research Testing

CONTROLS FOR RESEARCH TESTING

Specific Procedures	Variables Controlled
1. The number of children in each group is to be 115.	1. An N of 100 will provide a sufficient N in each cell of the data matrices.
2. The examiners' abilities will be checked by:	
a. Visitation by non-participant observers. (If an observer finds a deficiency, he is to call in a second observer to check his finding.)	2. a. Observers familiar with testing requirements will be able to identify inadequacies in testing procedures.
b. Tape recordings will be made of each examiner on two separate occasions with two different tests.	b. Same as above, but a more objective measure of examiners' performance.
c. Check the item by item scores on answer sheets of the testers in each sub-battery. Each evaluator will spend a minimum of two hours weekly screening completed answer forms.	c. This is a check to see if there is any variation in testing techniques with regard to any specific test.
3. Offer to give Head Start Centers diagnostic information regarding their subjects' performance on the various tests. Make it clear that information cannot be given for all children, but only for those with particular problems.	3. This is an incentive to get Head Start Centers to participate in our testing program.
4. Soft toys are to be given (as rewards) to all children at the end of each testing session.	4. These toys or rewards serve a dual purpose of motivating the children for best test performance and for keeping them happy.
5. A person or persons will be appointed to supervise children who are waiting to be tested.	5. This will facilitate good scheduling of children to be tested, prevent unnecessary loss of time, and keep children quiet, happy, and occupied.

Specific Procedures	Variables Controlled
6. An examiner is to be trained to administer no more than one-half of a battery of tests (either three or four separate tests).	6. The examiners will become expert at those tests which they ar administering and each examiner will have approximately an equal work load and working time.
7. Only one child is to be tested in a room at a time, whenever and wherever such conditions are permissible.	7. This arrangement insures better rapport between the examiner and the subject. It decreases the possibility of distractions which limit the validity and reliability of data.
8. The Stanford-Binet, the WPPSI, and the Caldwell color items (items 79-85, which are administered at the end of the WPPSI test) are designated anchor tests and are to be given to all children in the sample. These tests are to be given before all other tests.	8. This procedure establishes or represents a constant or base for all groups of 115 children, making a comparison of the different batteries possible.
9. Ordering of the tests will be arranged so that the remaining six tests (for each battery) will be different for each group of 115. Each group will be broken into two segments of fifty children. One of the segments will be given a test in order of 1, 2, 3, ..., n and the other will be given n, ..., 3, 2, 1.	9. This procedure will check the effect of the order of test administration.
10. The tests which are administered to a group of 115 are to be as different from each other as possible.	10. This procedure will increase the range of coverage of possible potential factors of ability as well as provide for less practice effect within a battery.
11. Each battery will be administered to approximately one-third four-year olds, one-third five-year olds, and one-third six-year olds.	11. Such a procedure will permit rank ordering of the items through a developmental age range.

CONTROLS FOR RESEARCH TESTING--Continued

Specific Procedures	Variables Controlled
12. A maximum of five testers can be in a center at one time. The testers are to be spread out in a variety of centers at one time.	12. This procedure will prevent confusion in scheduling the testing of children and interference due to lack of space. It will also reduce disruption of classroom activities.
13. No child is to be tested	13. The procedures will
(a) more than three sessions per week	(a) reduce fatigue and practice effects
(b) for a session lasting longer than 1½ hours, regardless of whether or not a break is taken	(b) reduce fatigue and practice effects
(c) if he has already been tested by the psychological services division of the Columbia City School system.	(c) prevent possibility of test-wiseness

Appendix F

Research Personnel

RESEARCH PERSONNEL

Name	Professional Training	Research Responsibilities
	Central Center Staff	
Myles I. Friedman	Ph. D., Educational Psychology	Committee Chairman and Project Director
George H. Lackey, Jr.	Ph. D., Elementary Education and Administration	Research Administration
John C. Otts	Ph. D., Educational Administration	Dean, School of Education
Charles R. Statler	Ph. D. (Pending), Educational Psychology: Measurement and Statistics	Testing Procedures
Mary Ann Pollack	B. S., Business Administration	Administrative Assistant
William H. Castine	M. Ed. (Pending); Doctoral Student in Educational Research	Assistant Project Director
Robert Branham	M. A., Education; Doctoral Student in Educational Research	Testing and Test Coordination
Parker W. Hall	M. S., Education; Doctoral Student in Educational Research	Sample Selection and Tester Training
Pearce McCall	B. S., Psychology and Business Administration; Doctoral Student in Educational Research	Tester
John H. O'Connell	M. A., Counseling and Guidance; Doctoral Student in Educational Research	Compilation of Bibliography in Cognitive Development and Related Fields
Barry J. Reinstein	M. S., Psychology; Doctoral Student in Educational Research	Tester Training and Quality Control, Development of Manuals
John L. Saunders	M. Ed.; Doctoral Student in Educational Research	Sample Selection and Quality Control

RESEARCH PERSONNEL--Continued

Name	Professional Training	Research Responsibilities
	Central Center Staff Continued	
Nancy Wludyka	M. Ed. (Pending); Doctoral Student in Educational Research	Selection of Instruments, Development of Manuals, Tester Training, Testing, and Quality Control
Patricia L. Buzhardt	B. S., Business Education	Junior Research Assistant
Linda Lee Ray	Two-Year Certificate, Secretarial Science	Junior Research Assistant
Mary Pat Richardson	B. S., Secondary Education and Business Administration	Junior Research Assistant
Henrietta Wilkins	Two-Year Certificate, Secretarial Science	Junior Research Assistant
Carol Marentette	Two-Year Certificate, Executive Secretarial Science	Secretary
	Temporary Field Personnel	
Paul E. Stanton	Ph. D., Guidance and Counseling	Field Director
Russell L. Strange	A. B., Psychology; Graduate Student in Guidance and Counseling	Field Coordinator
Angela G. Ayer	B. A., English	Tester
Wilfred L. Brooker	B. S., Psychology; Doctoral Student in Psychology	Tester
Peter J. Boyle	M. A., Psychology; Doctoral Student in Psychology	Tester
Marion E. Burns	M. A., Psychology; Doctoral Student in Psychology	Tester
Norman S. Chambers	M. A., Psychology; Doctoral Student in Psychology	Tester
John Edmunds, Jr.	Ph. D., History	Tester

RESEARCH PERSONNEL--Continued

Name	Professional Training	Research Responsibilities
	Temporary Field Personnel Continued	
Glenn O. Geiger	B. A., Psychology; Doctoral Student in Psychology	Tester
Ralph E. Hatchell	B. A., Psychology; Doctoral Student in Psychology	Tester
C. Eugene Hendrix	M. A., Psychology; Doctoral Student in Psychology	Tester
Clifford I. Holliman	B. BA.; Graduate Student in Psychology	Tester
Reid T. Johnson	B. A., Mathematics and Psychology; Doctoral Student in Psychology	Tester
Lucile B. McConnell	B. S., Psychology; Graduate Student in Psychology	Tester
Kaye F. McElveen	A. B., History; Graduate Student in Guidance and Counseling	Tester
James H. Montgomery	B. A., Psychology; Doctoral Student in Psychology	Tester
Alan P. Neidich	M. A., Psychology; Doctoral Student in Psychology	Tester
Frank D. Ohler	B. S., Psychology; Graduate Student in Psychology	Tester
Charles L. Robinson	B. A., Psychology; Doctoral Student in Psychology	Tester
Herbert A. Rosefield	A. B., Psychology; Doctoral Student in Psychology	Tester
Martin F. Rosenman	M. A., Psychology; Doctoral Student in Psychology	Tester
Gene J. Sausser	M. A., Psychology; Doctoral Student in Psychology	Tester
Linda B. Schmidt	B. S., Psychology	Tester

RESEARCH PERSONNEL--Continued

Name	Professional Training	Research Responsibilities
	Temporary Field Personnel Continued	
Allen E. Shealy	B. S., Business Administration; Doctoral Student in Guidance and Counseling	Tester
Martha S. Stanton	A. B., Primary Education	Tester
Kirklin Stokes	M. A., Psychology; Doctoral Student in Psychology	Tester
Rebecca G. Swanson	M. Ed.; Doctoral Student in Elementary Education	Tester
Robert D. Towell	M. A., Psychology; Doctoral Student in Psychology	Tester
Jaren Van Den Heuvel	M. A., Psychology; Doctoral Student in Psychology	Tester
David M. Waldman	M. A., Psychology; Doctoral Student in Psychology	Tester
Wade Williams	B. S., Psychology; Graduate Student in Psychology	Tester
Sara B. Wise	M. A., Education	Tester
Bonnie A. Workman	A. B., Special Education	Tester
	Consultants	
Milly Cowles	Ph. D., Early Childhood Development	Early Growth and Development
Kathryn B. Daniel	Ph. D., Educational Psychology and Guidance and Counseling	Tester Training
David Garron	Ph. D., Human Development	Tester Training
Garrett Mandeville	Ph. D. (Pending), Educational Statistics	Statistical Design
Gerald Kline	Ph. D., Social Psychology	Design

Appendix G

Tester Evaluation Sheet

HEAD START RESEARCH
Summer, 1967
TESTER EVALUATION

Examiner's Name_____ Examiner's No._____

Test being given_____

Observer_____

Date_____ Time spent observing (minutes)_____

Directions: The rater is to place a check at the appropriate position on the continuum, designating in his judgment the examiner's competence.

1. In regard to rapport with the child, does the examiner:

   a. Relates easily with child. (Ideal Tester) _____
   b. Relates well but a better relationship is not impossible. _____
   c. Honest attempt at relationship with child but does not employ appropriate approach. _____
   d. Relates poorly to child (gives test mechanically; is preoccupied with answer sheet, etc.) _____

2. In regard to the examiner's familiarity with materials and procedures he:

   a. Knows the test. Only refers to printed material that is too long or intricate to commit to memory. _____
   b. Needs only minimal reference to notes for proper administration of test. _____
   c. Some lack of familiarity with test materials and their use. (Inefficient procedures) _____
   d. Lack of familiarity which has detrimental effect on data. (Inappropriate procedures) _____

3. In regard to the degree and appropriateness of probing (questioning procedure) the examiner:

   a. Probes consistently and effectively without cueing response. _____
   b. Attempts to probe at every opportunity but technique restricts effectiveness. _____
   c. Questions effectiveness of probing technique _____
   d. Lacks at/or ineffective probing. _____

4. To what extent is the examiner able to detect and alleviate the child's fatigue and/or biological needs?

   a. E immediately recognizes the first signs of needs of S and takes appropriate action. _____
   b. E is alert enough to break up testing period before S becomes distracted. _____
   c. Inappropriate attention to needs. (too seldom or too frequent.) _____
   d. E continues to test although S is extremely tired and has overriding biological needs resulting in random or invalid responses. _____

5. In your judgment, the data obtained by this examiner are:

   a. Acceptable. _____
   b. Questionable and requires careful review _____
   c. Unacceptable. _____

7/8/67

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