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An Investigation of the Value of Detection of Potential Readnig Difficulties at the Kindergarten Level Followed by Specific Individualized Instruction as a Preventative Measure Against Reading Failure

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DISSERTATION APPROVAL

AN INVESTIGATION OF THE VALUE OF DETECTION OF POTENTIAL READING DIFFICULTIES AT THE KINDERGARTEN LEVEL FOLLOWED BY SPECIFIC INDIVIDUALIZED INSTRUCTION AS A PREVENTATIVE MEASURE AGAINST READING FAILURE

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ABSTRACT

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A Dissertation Submitted in Partial Fulfillment of
The Requirements for the Degree of
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ABSTRACT

The purpose of this investigation was to use and evaluate a preventative measure against reading failure at the kindergarten level. This technique of prevention used diagnostic detection of potential reading difficulties followed by individualized treatment of indicated problem areas. A careful attempt was made to answer the following questions.

1. What is the most effective time to begin remedial reading instruction?
2. Do undetected difficulties in pre-reading skills lead to reading failure?
3. Is the original kindergarten screening test used as efficient as, or more efficient than, the standardized tests in current use?
4. Which techniques and methods of instruction are most effective for teaching pre-reading skills?
5. Can teacher aides, given training, be used effectively for individualized instruction?

The kindergarten population of a large urban public school district with a high percentage of bi-lingual (Portuguese) residents and a history of reading problems was selected for this study.

From a group of 1,200 kindergartners a sample of 264 was selected. Each child received a battery of reading, achievement and diagnostic tests. An original Kindergarten Screening Test--to be referred to as the KS test--was used as one of the diagnostic instruments. Those children who failed five or more test items were included in this study.

A Campbell and Stanley two group post-test design was used as a

model. A total of twenty schools were involved in the study. The results of this investigation proved that:

1. The kindergarten level is a favorable and appropriate time to begin instruction based upon diagnosed weaknesses in pre-reading skills.

2. The value of early identification and treatment of diagnosed weaknesses of pre-reading skills can be measured by its effectiveness in later reading achievement.

3. The KS Test proved to be as efficient as the standardized tests used, with clearer diagnostic implications in some areas.

4. Bi-lingual and slow learning children showed gains in reading skills following early diagnosis and individualized instruction.

5. Training and use of teacher aides as tutors proved to be an effective and useful adjunct for the classroom teacher at kindergarten level.

In general, this program of early identification and individualized instruction was successful in bringing up to grade level those children identified as having potential learning difficulties.

ACKNOWLEDGEMENTS

My deep gratitude is extended to Dr. Joseph Carbone, who came to be my advisor at a difficult time due to my Peace Corps commitment. His professionalism, flexibility, and encouragement enabled me to persevere through adverse circumstances, as he guided me toward completion.

Other professional persons who have contributed much are Dr. Florence Mahon and George Nigro. I, also, thank my friends Mary Berardo and Jane Stetson for their supportive services.

A loving thought goes to my mother whose family motto "Graigallaghee" (Stand Fast) is always before me, and to my late husband who would have approved my efforts.

May God bless my words that they may prove useful.

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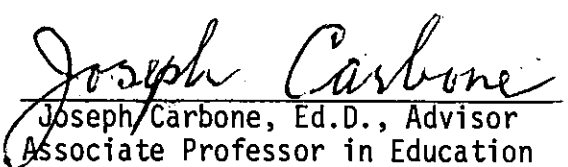

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STATEMENT OF THE PROBLEM

One of the important and persistent problems in education today is the increasing number of students who fail in reading. Expectations for academic success are endemic to the socio-economic growth of most American children. One of the necessary skills to achieve this end is skill in reading; instead there is a scandalous record of reading failure.

Educators concur that there is no excuse for the continuing record of reading failure. Yet, it persists regardless of the voluminous research, changing techniques of teaching reading, and an increasing number of innovative reading systems.

This investigation attempted to find an answer to the problem through testing and evaluating preventative measures against reading failure. These measures consisted of diagnosis of individual weaknesses in skill areas relevant to the acquisition of reading skills at the kindergarten level followed by individual instruction in the incipient problem areas. This treatment was found to aid the child in attaining grade level reading skills and the time of assistance proved effective in the learning process.

Intensive reading of other studies only indicated that there are "Quot homines tot sententiae". However, it is hoped to stimulate interest in preventative measures against reading failure for future investigators.

Scope of Investigation

The complex and diffuse problems originating from reading failure have been attributed to many causes. These causes become as varied as the backgrounds of the writers. Sociologists tend to emphasize population mobility and the increase in the migration of bi-lingual families. Psychologists indicate faults in the educational patterns and a cultural trend toward visual stimuli such as pictorial rather than verbal descriptions. Color coding, and the use of tapes, audio-visual effects and verbal interchange obviate the need for reading skills. In addition, there are many changing or modified concepts on the theory of instruction.[1] Educators look for poor eye-hand coordination, careless auditory or visual discrimination, or maturational lag.[2] Few persons tend to relate objectively to reading skill the problems encountered by the kindergartner in his new world of words. It is with such an objective analysis that this study proceeded to explore.

It was within these areas directly related to the acquisition of reading that the scope of this investigation remained. It was limited to the early diagnosis and development of the following skills relevant to success in reading:

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[1]Ernest R. Hilgard and Gordon H. Bower, Theories of Learning (New Jersey: Prentice-Hall, Inc., 1975, 4th Ed.), Chapters 15 and 16, pp. 550-638.

[2]James C. Chalfont and Margaret A. Scheffelin, Central Processing Dysfunctions in Children. A Review of Research, Ninds Monograph No. 9, (Bethesda, Md., U.S. Department of Health, Education, and Welfare, 1969), p. 148.

1) Auditory discrimination of words[3]
2) Matching words - visual discrimination[4]
3) Verbal fluency[5]
4) Speech development (correct formation of letters and sounds aid auditory discrimination
5) Auditory discrimination of s and ds[6]
6) Match, coordination eye-hand
7) Match, coordination body
8) Writing numerals
9) Perception - reversals of either letters or numbers
10) Copying - shapes
11) Copying - letters (different from matching as other skills are used)[7]
12) Matching - designs

These skills were evaluated for their use and effectiveness in providing a basic groundwork from which to progress to reading success and grade level achievement.

Research Design and Procedures

The total kindergarten population of a large urban, northeastern city was screened for potential learning difficulties. A battery of reading, achievement, and diagnostic tests were administered. In addition, the IQ, and the results of the (KS) Kindergarten Screening Test were recorded for each student. Only those who failed five or more items on the KS test were included in this investigation. Many of the sample population came from bi-lingual (Portuguese speaking) family backgrounds.

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[3]Katrina deHirsch, Jeannette Jefferson Jansky, and William S. Langford, Predicting Reading Failure (New York: Harper & Row, 1966), p. 19.

[4]Edward W. Smith, Stanley W. Krause, and Mark M. Atkinson, The Educators' Encyclopedia (New Jersey: Prentice-Hall, Inc., 1963), p. 320.

[5]Robert E. Valett, The Remediation of Learning Disabilities: A Handbook of Psychoeducational Resource Programs (California: Fearon, 1967), Program No. 38.

[6]Smith et al., The Educators' Encyclopedia, pp. 324-25.

[7]deHirsch et al., Predicting Reading Failure, p. 24.

Research Design

The research design used was a post test two group design #6 from Campbell and Stanley formulated as follows:

Group 1. R X O_1 (Experimental)

Group 2. R X O_2 (Control)

Times: 1, 2, 3, 4, 5 and 6.[8]

Procedure

At Time 1, potential reading failures among the total kindergarten population were identified by the battery of pretests.

At Time 2, those pupils failing five or more items on the KS test were separated from the total kindergarten population screened.

At Time 3, the sample population was randomly placed into Group 1 (Experimental) and Group 2 (Control).

At Time 4, all selected students received assistance in individualized instruction. The Experimental Group received the Mahon System exclusively, while the Control Group received the Lippincott or other systems favored by individual schools.

At Time 5, the post test period, each group received three sets of achievement tests.

At Time 6, the raw data was codified for computer and statistical analysis and results compiled for analysis.

Approximately four percent failed to finish all parts of the experiment. This was caused by illness, moving away from the area, or transfers. Incomplete information was approximated by using the model

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[8]Donald T. Campbell and J. C. Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago: Rand McNally & Co., 1963), pp. 6-10.

score of the particular school attended by these students.

Justification

This investigation was made because a study of reading research at the kindergarten level indicated a lack of specific and objective data on preventative reading measures applied at this level of instruction. The disproportionate number of reading failures was also considered in relation to the increase of available innovative teaching material and remedial techniques.

It is known that an estimated four million elementary school children remain disabled readers. That the problem is an educational one was stressed by Ray H. Barsch, a specialist in learning difficulties. He said:

> The failing learner is no longer a statistic of minor significance . . . the percentage of failing students is increasing annually. In the final analysis, the issue is educational. This focus must be maintained by all disciplines that come upon the scene.[9]

Katrina deHirsch, a recognized authority in reading research, emphasized the need for early identification.

> Twenty years of clinical experience with intelligent, but educationally disabled children, whose learning drive has become severely damaged, has convinced us that many of these children would not have required help had their difficulties been recognized at early ages. Early identification would have obviated the need for later remedial measures.[10]

Another aspect of early identification of potential learning problems is that many children erroneously classified as retarded may be

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[9]Ray H. Barsch, "Perspectives in Learning Disabilities: The Vectors of a New Convergence," Journal of Learning Disabilities 1 (January 1968): 4-20.

[10]deHirsch et al., Predicting Reading Failure, 92.

able to join the main stream of students receiving prescriptive teaching.

> With the help of early identification, many children of retarded mental development can enter in regular classes for normal children, or receive help of the kind that their handicaps require without special services, said James Gallagher, who was Commissioner attached to Education of the Handicapped, U.S. Department of Health, Education, and Welfare, quoted Sara Stutz in her important article on New Horizons for Retarded Children.[11]

The reported results indicated that it was effective to begin early diagnosis of potential reading problems followed by individual instruction. This information may focus attention on the need for more experimentation at the kindergarten level as a preferable time to instruct toward reading success. Morgan and King observed that an educational necessity to reduce the growing percentage of reading failures is effective timing and appropriate use of relevant teaching materials.[12]

Current emphasis on early maturation and developing intelligence are further evidence of the need for this study. Bloom stated that fifty percent of all growth in human intelligence takes place between birth and four years of age.[13] Developing intelligence, according to Piaget, originates in the sensory motor and preoperational stages of growth, that is in the early years.[14]

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[11]Sara Stutz, "Nuevos Horizontes para los Ninos Retrasados, Selecciones de Readers Digest (New Horizons for Retarded Children, Selections from Readers Digest) (Mexico: Readers Digest), March 1975, 61-64.

[12]Clifford T. Morgan and Richard A. King, Introduction to Psychology (New York: McGraw-Hill, 1971, 4th ed.), p. 188.

[13]Benjamin S. Bloom, Stability and Change in Human Characteristics (New York: Wiley & Sons, 1964), p. 88.

[14]Jean Piaget, The Origins of Intelligence (New York: International Universities Press, 1966), p. 49.

It was hypothesized that the diagnosis of potential learning problems was most effective at the kindergarten level because:

a) Such a diagnostic profile provides a tool for the teacher to plan instruction in weak or undeveloped skill areas, and

b) Instruction is given at a time prior to experiencing academic failure, thus eliminating emotional blocks to learning. (See Chapter II, pp. 12 & 13)

Haring and Ridgway advocated early identification of the child with learning disabilities in order to prevent more serious learning problems from occurring.[15] Another advocate of early identification, Thomas, recommended looking to the kindergarten teacher for assistance.[16]

In accord with the stated purpose of this investigation, diagnosis and evaluation was limited to the kindergarten level. The kindergarten teacher makes a beginning in all aspects of learning that are important to reading skills.[17]

Early identification and its impact on the slow learner was recognized by Green. Children in the United States often show most rapid progress in reading about the time they reach a mental age of six-and-a-

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[15]Norris G. Haring and Robert W. Ridgway, "Early Identification of Children with Learning Disabilities," Exceptional Children 33 (February 1967): 387-95.

[16]Althea P. Thomas, "The Identification and Evaluation of Learning Disabilities by the Classroom Teacher," Academic Therapy Quarterly 1 (Winter 1965-66): 82.

[17]Constance M. McCullough and Miles A. Tinker, Teaching Elementary Reading (New York: Appleton-Century-Crofts, 1968, 3rd ed.), p. 413.

half. However, it is the less bright child who can show the most permanent effects of early instruction in reading.[18]

Education in a democratic society is to provide a climate in which the student may reach his potential to function as a citizen of that society.[19]

One of the functions needed to acquire optimal learning is skill in reading. So, it is offered that this investigation is important because it focuses on the time of learning regarded, currently, as most effective in the maturational pattern, and it also provides for maximal use of school facilities. No duplication of this study was found at the time of inquiry. It is presented as a useful adjunct to implement research in the successful acquisition of reading skills.

Summary

The problem of reading failure and its prevention was the purpose of this investigation. A consensus revealed that early identification of potential reading difficulties is advocated and that reading failure is considered an educational issue.

These two fields of inquiry were studied. Subsequently, a plan of early identification was initiated within an urban school site.

A total of 1,400 kindergarten level school children were screened for potential learning difficulties. Those children who failed five or more items in the screening process were selected for the sample population. From the sample population experimental and control groups were randomly

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[18]Donald Ross Green, Educational Psychology (New Jersey: Prentice-Hall, Inc., 1964), pp. 33-34.

[19]Smith et al., The Educator's Encyclopedia, p. 34.

formed. Each pupil in both groups received half an hour's personalized instruction daily. All of the experimental group received the Mahon system of instruction and the control group followed the system of standardized instruction used by the building principal, at Time 4, in the research design.

The results of the screening and subsequent training are further described and documented in the following chapters.

CHAPTER II

REVIEW OF LITERATURE

A careful study was made of the voluminous and detailed material available on the varied aspects of reading preparation at the kindergarten level. In view of the lack of similar studies and the scope of material available, it was decided to limit references to those most relevant to stated aspects of this investigation. Therefore, in substantiation of the hypothesis that "Early identification of potential learning difficulties followed by prescriptive teaching serves as a preventative measure against reading failure," authorities in the field are quoted in reference to:

1) Early identification and the educational problem
2) Basic skills deemed necessary to the acquisition of reading
3) Management and classroom environment
4) Transfer of training

In early identification and the educational problem, the literature suggests that tests given to youngsters when they are beginning school may be of some value in predicting achievement. Lee and Allen explored objective and subjective means of early identification.[20] Five different kinds of observations, with from three to eight items in each category are discussed for their relevancy in gauging a child's development for effective program planning. In addition, a group of intelligence

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[20]Doris M. Lee and R. V. Allen, Learning to Read Through Experience (New York: Appleton Century Crofts, 1963), pp. 14-29.

and reading readiness tests are listed.

Among the many items used for evaluation in reading studies the intelligence quotient has not been accorded especial significance in early identification. It was used, however, as one of the identifying factors in this investigation.

Actually, de Hirsch et al ranked the IQ as twelfth among predictive measures.[21] Eleven other kindergarten tests namely, Pencil use; Bender Visuo-Motor Gestalt Test; Wepman Auditory Discrimination Test; Number of words used in a story; Categories; Horst Reversals Test; Gates Word Matching Test; Word Recognition I and II; Lloyd Dunn's Picture Peabody Test; Word Reproduction and letter naming proved better predictors of subsequent reading achievement.

The individual test may provide only one aspect of a child's performance. In the measurement of various skills concomitant to the learning process a variety of tests are usually given. A study by Olsen and Rosen explored five batteries of readiness measures and concluded that:

> There continues to be a need therefore, for investigation designed to explore various reading constructs with the goal of further isolating those factors which seem most critical to specific reading behaviors at particular points in time in the developmental sequence.[22]

Marianne Frostig, a recent advocate of a modern technique in reading instruction, emphasized eight areas frequently needing remediation:

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[21]de Hirsch et al., Predicting Reading Failure, p. 33.

[22]Arthur V. Olsen and Carl L. Rosen, Exploration of the Structure of Selected Readiness Tests (Georgia State University). Paper presented, Annual Meeting, American Education Research Association, New York City, February 4, 1971, pp. 1-9.

sensory-motor; auditory and visual perception; expressive and receptive language; memory; symbolization; integrative functions and motivation.[23]

In general, kindergartners are not exposed to the more formalized academic structure. However, it has been established through this investigation that the youngsters may be exposed to formal instruction without any deleterious effect. For example, the experimental group learned the difference between "oo" and "o" at the same time without showing signs of confusion or stress.

The kindergartner who receives a structured program emphasizing socialization, perceptual-motor activities, auditory and visual discrimination and memory training is given the opportunity for the identification and evaluation of learning disabilities by the classroom teacher, as these areas are all means of identifying learning disorders and disabilities. The child who fails to function as a group member for a number of reasons and, of necessity, wants a good deal of individual attention may be recognized as having a disability.[24]

Harkham et al debated the efforts made to develop a teaching method to insure reading success. According to this study, despite years of effort and experimentation, no one method has been uniformly effective in attaining this criterion. They stated:

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[23]Marianne Frostig, D. W. Lefever and J. R. B. Whittlesey, The Marianne Frostig Developmental Test of Visual Perception (Palo Alto, California: Consulting Psychologist Press, 1964).

[24]Thomas, "The Identification and Evaluation of Learning Disabilities by the Classroom Teacher," pp. 81-83.

> Another approach more fruitful in relation to the problem of reading success and failure is to attempt to predict those children who will encounter difficulty in reading irrespective of the method of instruction.[25]

The kindergarten screening test used reception, association, verbal ability and expression to predict potential learning difficulties and individual weaknesses in various skill areas associated with reading.

The kindergarten teacher was identified by McCullough and Tinker as providing a communication link for the average child by arranging the classroom environment for motivation of word recognition.[26]

Early identification was accepted as a necessity in a majority of studies, although the results were not always utilized effectively. That is, test results were always recorded but not always used as a basis for program planning.

Among other problems encountered was the traditional role of the school in the learning process. The building principal may select and influence the kind of instruction for the student population. Many times this choice of instruction is based upon a traditional approach to reading. Limited flexibility in teaching may be detrimental to the child needing a more eclectic approach. A greater, not less, competency in the basic skills is needed today, as the complexities of modern living increase.[27] Bloom, Davis and Hess recommended that evidence should be obtained on each

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[25]Laura D. Harkham et al., Multiple Prediction of Reading Achievement in Grades One through Four using Kindergarten Measures. Paper presented, Annual Meeting, American Education Research Association, New York City, February 4, 1971, pp. 1-10.

[26]McCullough and Tinker, Teaching Elementary Reading, p. 413.

[27]Smith et al., The Educator's Encyclopedia, p. 34.

child at the beginning of first grade to determine the levels he has reached with regard to perceptual development, ability to attend (listening skills), and motivation for learning.[28] These authorities, and Russell and Lee, as well as others concur in the selection of appropriate channels for the individual approach in learning to read.[29]

An important consideration in the psychology of learning is that of transfer of training.

In 1949, Osgood summarized the results of experimentation in the transfer of training. His diagram of a transfer surface graphically depicts the importance of stimulus and response similarity.[30]

E. L. Thorndike and A. S. Woodworth's intensive experiments resulted in the conclusions that training is one kind of activity which only aids a positive transfer in performance if the two activities have identical or common elements such as materials, methods, or student attitudes.

The positive transfer of the sound-symbol relationships taught in this investigation was predicated on the theory of the importance of similarity between stimulus and response.

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[28]Bloom, Stability and Change in Human Characteristics, p. 88.

[29]D. Russell and H. R. Lea, "Research on Teaching Reading," Handbook of Research on Teaching, N. L. Gage, ed., American Education Research Association (Chicago: Rand McNally & Co., 1963), p. 868.

[30]C. E. Osgood, "The Similarity Paradox in Human Learning: A Resolution," The Psychological Review 56 (May 1949): 133.

Summary

Most studies reviewed pertained either to diagnosis, factor analysis and investigation of motivational factors. The research is voluminous but does not seem - for the most part - to be extrapolated or applied in many school systems. It was found that some studies were made at the kindergarten levels but once the research was completed little application of the findings was evidenced.

Some studies have been conducted by such individuals as Staats,[31] and McNinch[32] in universities and through the U.S. Office of Education.[33]

Perhaps it is time to begin correlating reading research and redesigning curriculum content, in the formative years, for the improvement of education and reading skills in particular. It is proposed that this project was a necessary adjunct to the more abstract reports available, and is presented as such.

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[31]Arthur W. Staats et al., Learning and Cognitive Development: Representative Samples (Reading, Number Concepts, Writing) and Experimental Longitudinal Methods. Monograph (University of Hawaii, Honolulu: 1969), p. 184.

[32]George McNinch, Predictive Values of Selected Auditory Perceptual Factors in Relation to Measured First Grade Reading Achievement (University of Southern Mississippi, Hattiesburg: 1970), p. 26.

[33]Office of Education (DHEW) Studies No. 1 and 2, Prediction of Achievement in the First Primary Year (University City School District, Mo.: 1969), p. 12 and Predictions of Readiness in Kindergarten and Achievement in the First Primary Year (Mo.: 1970), p. 15.

CHAPTER III

DISCUSSION OF RESEARCH DESIGN AND PROCEDURE

This investigation was deemed necessary because of the extraordinary increase in reading failures despite the increase in trained teachers, innovative reading materials (from the commercial houses) and improved reading techniques and remedial methods.

It was observed that the child who was placed in a transitional class, between kindergarten and grade one, exhibited a number of problems. Some of the problems may be attributed to lack of maturational level of achievement, or undetected physical or emotional disorders.

The investigation attempted to isolate the particular learning difficulty at the kindergarten level. Within the objective analysis of the individual student's learning difficulties, a specific, prescribed program of teaching was made available to each student in the experimental group.

The control group also had their learning problems identified but received only the intensified instruction of the reading program favored by the individual school principal.

This investigation took into account many of the variables affecting the learning process namely: climate of learning and home motivation, level of maturation, ethnic background, pre-school exposure to reading materials, bi-lingual background, peer acceptance, physical, emotional and/or mental difficulties. At the inception of the study, a regularly scheduled teacher training program was set up by Florence

Mahon, Assistant Superintendent of Schools, New Bedford, Massachusetts, whose direct interest was in upgrading the reading levels of the student population.

The learning process in the kindergarten level was outlined as follows:

1) Visual recognition of the letter configuration.
2) Discrimination of one letter configuration from another.
3) Listening recognition of the acoustic sound represented by the letter learned through visual configuration.
4) Audio-discrimination of the letter sound.
5) Association of the acoustic letter sound with the visual recognition.
6) Progression of blending letter sound and visual recognition of letters into one syllable words.
7) Learning the proper arrangement of letter-sounds in given words.

It was within these seven basic areas that much initial work was achieved with the experimental group. This differed from the control group in that a direct stimulus-response teaching was utilized with the experimental group; whereas, with the control group the teaching or remediation was left to the discretion of the building principal. In each of the twenty schools involved, one half hour of instruction was made available daily to each of the students who had failed five or more items in the original screening tests.

The experiment took place over "Times one through six". At the beginning, 1,200 kindergartners were screened by the tests indicated in page 26 of Chapter IV. Following the screening a sample of 264 students

were identified as having potential reading problems. These students were allocated for further treatment into either Group 1, Experimental; or Group 2, Control; by a random process of selection. In all twenty schools selected the teachers and teacher aides were responsible for administering the pre-test and post-tests.

Three sets of achievement tests were administered, scored and recorded for each pupil in the Experimental and Control groups. These tests were labeled as the Metropolitan (Met), Houghton Mifflin (HM), and Lippincott (Lip). The last, the Lip, was further broken down into Lip A Form and Lip B Form with Lip T used to identify the totals of Lip A and Lip B into one final total. All students were tested except those transferred out of the program.

The Slingerland, Mahon, and Metropolitan Readiness Tests were used as screening devices in the pretest period. These tests were administered to all students entering the first grade to identify those with potential reading difficulties to be subject to the study.

The elementary schools having such students were then assigned to either Group 1, to receive the Mahon System of assistance (X_1), or Group 2, to receive only teacher prepared assistance exclusive of the Mahon System (X_2).

Following the training phase, that is in the posttest phase, the Metropolitan Readiness Test and the Lippincott, Form B were administered for comparison of gain scores.

The program of early identification followed by individualized instruction was successful in bringing up to grade level those children identified as having potential learning difficulties.

In the ten schools included in the Experimental Group the teachers

and teacher aides were trained in the same method of individualized instruction.

The other ten schools that formed the Control Group received the same pretests and posttests but the instruction followed the pattern of the basic reader generally used.

In each of the groups individualized instruction was administered by teacher aides for half an hour daily during the regular class period. While the study was in progress it was discovered that the utilization of teacher aides proved effective in individualized instruction. Thus the investigation caused little disruption to normal classroom procedure.

Data received from the individual schools was recorded by the secretary employed for the project. She was also responsible for recording and obtaining late return of data where indicated by the director.

The information obtained was then recorded on cobol sheets by the statistician and director prior to preparation of data for the computer.

Each school was first approached through the building principal. The purpose of the investigation, the children involved and how they had been selected was explained in detail. Once the cooperation of the school's principal was obtained there were minimal difficulties in working with the teachers and teacher aides.

One of the problems encountered was completing the screening and testing in all schools at approximately the same time. Some teachers believed more time was needed for instruction. However, there was a six month time lapse between pre and posttesting. The rest of the school year was used to process the data. Research students were used in handling the computerized data.

A description of the difference between the Mahon method of in-

struction and major reading series is outlined for explanatory purposes. More detailed comparisons are included in the Appendix (see pp. 52-59)

A comparison between methods in common use by major reading series and the Mahon system used in this investigation shows differences in the following areas.

1. Alphabet Names vs. Sounds: Usually letter names are taught first whereas Group 1 received instruction in learning the sound associated with each letter in its common use, such as "p" - the "puffing" sound.
2. Configuration of letter association with stimuli: Word Clue vs. Mouth Set. Generally letters or consonants are taught by aligning them with a pictured word. In the experimental group, the system used introduced the letter or consonant by the "mouth set" which produces that sound. That is, "m" is illustrated or superimposed on a pair of lips drawn as pressed together lightly. This is helpful to children who have short auditory memories as they receive the visual reinforcement concurrently.
3. Sound-symbol association: Word Clue vs. Isolation. Major reading series use a deductive approach. The letter sound is heard from a word clue. For example "m" may be superimposed over "mice". This method is difficult for slower children who are not able easily to transfer the initial consonant-sound to a different word such as "mother". In the Mahon system letter-sounds are learned in isolation, by sound-name and auditory/visual clues until they are readily identifiable by the child. When this step is achieved the initial consonant is then

presented with a mixed selection of words beginning with the learned consonant.

4. Development of Auditory Discrimination: No Clue vs. Visual Clue. The child learns initial consonants through repetition of sounds and can frequently confuse these sounds such as "hot" with "top" because his listening skills are underdeveloped and "beginning, middle and end" is not a clear concept for the child at this stage when associated with letter-sounds. Group 1 children were helped to hear the difference between "hot" and "top" because of visual clues, they saw the mouth-set first. The first word was shown with mouth-open and the second word shown with teeth-closed. Auditory discrimination follows visual clues.

5. Left to Right Sequence: Inconsistence vs. Consistent Pattern. Children are expected to identify initial and final consonants and vowels in random order. In this investigation consonants were taught in initial position only. The vowel is used as a pivot and final consonants are added last in a left-to-right sequential order.

6. Grouping of Consonants and of Vowels: Intermingled vs. Discrete. Consonants are presented as a series of groups with vowels intermingled. The experimental group learned consonants as one group placed first in the initial, left-to-right sequence, with a vowel as a pivot. Practice in this manner enables the child to see the transition from "pan" to "plan" without confusion.

7. Recognition of Vowel Sound: Word Clue Alone vs. Word Clue with Identifying Gesture. For example, usually the short vowel a begins the word apple. The slow learner has difficulty isolating the short vowel a as he did with initial consonants in item 4. Whereas, the experimental group learns the vowel sound with word clues but this is reinforced by a kinesthetic approach, i.e. a gesture. The child says the whole word and repeats the word when he is stopped by a gesture after saying the vowel, thus he learns to identify the vowel sound which can usually be prolonged in sound as opposed to consonants which usually cannot be prolonged.
8. Memory for Vowel Sounds: Without vs. With Associative Stimuli. The child is expected to discriminate short vowels by word clues alone. The Mahon system provides practice in workbook and worksheets and with color coded clues. For example, red "a" evokes word clue apple, yellow "e", the word clue egg.
9. Blending: Without vs. With Support. Blending is often presented by saying the letter-sounds fast. The experimental group were supported by many audio-visual stimuli. The vowel first combined with continuant consonants such as m, n, f are then combined with other consonants through use of rhyming. Plosives are learned last.
10. Rules for Vowels: Complex vs. Simple. Rules for vowels are not simplified, digraphs and "magic e" are taught separately. For the experimental group one rule was given for one syllable words, that is, one vowel is usually short, with two vowels the first takes its alphabet name. This comparison shows the

close relationship between stimulus and response experienced by the experimental group. It is offered that more attention should be given to this approach in reading readiness programs based upon known psychological research (see Chapter II, p. 14) and the evidence presented herein.

Summary

A discussion of the research design and procedure followed is given in the first four pages of this chapter. Within seven basic areas relevant to the acquisition of reading skills (see p. 11) visual and auditory discrimination were found to be very indicative of reading progress.

The post-test two group design was used in this research to determine:

1. The most effective time, scholastically, to identify potential learning problems and
2. To test the effectiveness of a unique system of individualized instruction compared with standardized procedures in overcoming identified learning problems.

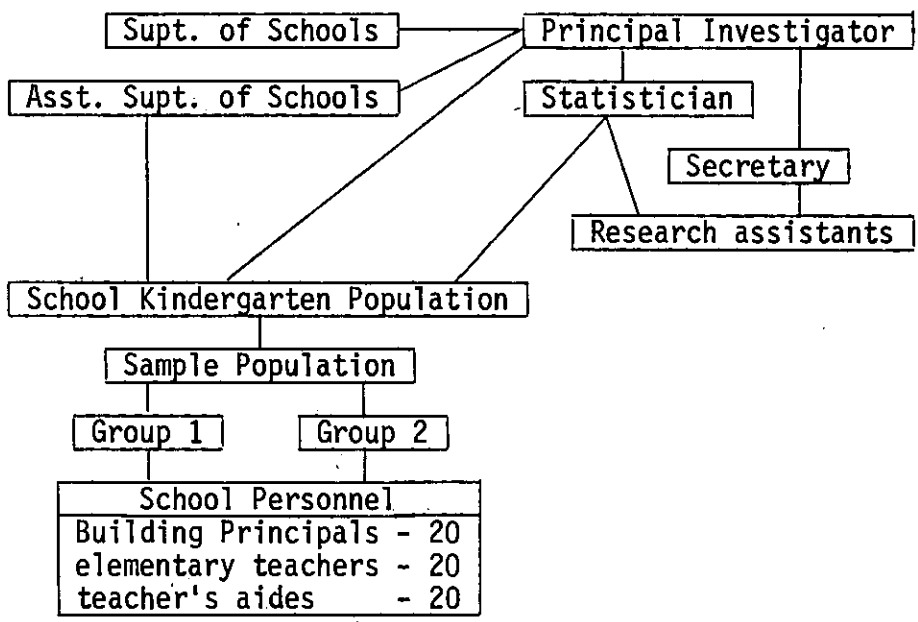
All tests used in the screening and post-testing are described. A comparison is included of the Group 1 and Group 2 method of instruction for those interested in methodology.

CHAPTER IV

PRESENTATION OF DATA

The data presented herein is to clarify the organization and use of personnel and materials. The statistical results given refer to the post-test phase and are a compilation of information received on each student completing this program of early identification and personalized instruction.

Fig. 1. ORGANIZATION OF PERSONNEL



The principal investigator worked closely within the schools' policies and initiated the program with full cooperation from school personnel, administration, faculty, staff and building principals. This cooperation was most effective and greatly facilitated the maintenance of the time schedule (see Fig. 2).

Fig. 2. ORGANIZATION OF RESEARCH DESIGN

PHASES	TIME 1-6	ACTIVITY
Pre-Test Phase	1	Screening of 1,400 kindergartners for potential learning difficulties in skill areas related to basic reading skills.
	2	Selection of kindergartners who failed five or more items in the initial screening tests.
	3	Randomization of selected population into Group 1, Experimental and Group 2, Control.
Learning Phase	4	Group 1, Experimental received the Mahon system of instruction from teacher's aides for one-half hour daily (see Chapter III, pp. Group 2, Control continued to receive standard instruction as chosen by the individual schools.
Post-Test Phase	5	Testing of both groups with a battery of achievement tests: Met, Lipp A & B and Houghton Mifflin.
	6	Gathering, computing, collating and processing test results. Statistical interpretation of results.

Tests and Materials used for Screening and Diagnostic Purposes

Screening Phase: TIME 1

1. Slingerland, Beth H., Tests: Pre-Reading Procedures, Educators Publishing Service, Inc., 75 Moulton Street, Cambridge, Mass. 02138, 1968; also Teacher's Manual; referred to as the Slingerland Test.
2. Mahon, Florence L., Kindergarten Screening Test, New Bedford Public Schools, New Bedford, Mass. 02740, 1969; also Teacher's Booklet; referred to as the Mahon Test.

Learning Phase: TIME 4

1. Mahon, Florence L., Little Listening Boy Visits the Village Where Everyone Can Read, Reynolds DeWalt, publisher, Industrial Park, New Bedford, Mass., 1965; and Work Text; plus supplementary leaflets; referred to as the Mahon System.

Post-Test Phase: TIME 5

1. Hildreth, Gertrude H.; Griffiths, Nellie L.; and Gauvrain, Mary E., Form A: Metropolitan Readiness Tests, Harcourt, Brace and World, Inc., New York, 1965; also Manual of Directions; referred to as the Metropolitan Test.
2. McKee, Paul; Harrison, M. Lucille; and Stroud, James B., Part Two - Diagnostic Test: A Pre-Reading Inventory of Skills Basic to Beginning Reading, Houghton Mifflin Co., Boston, 1962; also Teacher's Manual; referred to as the Houghton Mifflin Test and Lippincott A and B Forms.
3. McCracken, Glen; Walcott, Charles C.; and Bond, Mary F., Book A and B Achievement Tests for Lippincott's

Basic Reading, Lippincott and Company, New York; referred to as the Lip A and Lip B Tests.

The schools listed were randomly assigned by the investigating committee consisting of the Assistant Superindendent of Schools, the principal investigator and the statistician.

The statistician 'flipped' a coin while the principal investigator drew the names of the schools from a concealed source. The Assistant Superintendent of Schools listed the schools by name in Group 1 or Group 2 accordingly, that is 'heads' to Group 1 and 'tails' to Group 2. The schools were thus assigned as listed in Table I.

TABLE I

TIME 3

RANDOMLY ASSIGNED SCHOOLS

GROUP 1 (EXPERIMENTAL)		GROUP 2 (CONTROL)	
Name of School	No. of Pupils	Name of School	No. of Pupils
Swift	2	Clark	6
Lincoln	11	Dunbar	10
Parker	32	Winslow	6
Mount Pleasant	15	Knowlton	34
Congden	11	Taylor	7
Kempton	19	Phillips Avenue	7
Carney	13	Campbell	15
Rodman	11	Ashley	9
Hathaway	15	Ottiwell	18
Brooks	6	Clifford	17

GRAND TOTAL.....264

Time 3, refers to the time allocated to this aspect of the investigation.

Time 1, was the pre-test initial screening period. Time 2, refers to the selection of the sample population, namely those who failed five or more items (see Fig. 2).

In Table II, the predictive value of the Kindergarten Screening Test is visually depicted.

TABLE II

TIME 4

CHI SQUARE AND PHI COEFFICIENTS OF HIGH-LOW RANK ON MAHON KINDERGARTEN SCREENING TEST COMPARED WITH HIGH-LOW SCORE ON READING IN GRADE ONE FOR SAME POPULATION

Subtests	Chi Square	Strength of Relationship	Rating	Prediction for Low Group
1. Auditory Discrimination of Words	112.4*	.608	High	Yes-High**
2. Matching Words	101.6	.571	High	Yes
3. Verbal Fluency	98.8	.563	High	Yes
4. Deviation Intelligence Quotient (Lorge-Thorndike)	87.8	.531	High	Yes
5. Speech Development	67.8	.466	Moderate	No
6. Auditory Discrimination of Letter-Sounds	67.6	.468	Moderate	Yes
7. Writing Numerals	66.2	.434	Moderate	No
8. Motor Coordination-Hand	63.4	.451	Moderate	No
9. Withdrawal Tendencies	59.2	.437	Moderate	No
10. Motor Coordination-Body	48.9	.387	Low	No
11. Perception-Reversals	48.5	.394	Low	Yes-High
12. Copying Letters	48.0	.393	Low	No
13. Draw-a-Person Test	40.6	.332	Low	Yes-Barely
14. Dependency Tendencies	36.1	.338	Low	No
15. Writing Name	31.6	.319	Low	No
16. Copying Designs	18.8	.256	Low	No
17. Low Frustration Tolerance	11.7	.192	Low	No
18. Matching Letters	8.5	.164	Low	No
19. Chronological Age	3.2	.122	Low	Yes-High

*At $p = .05$, $X^2 = 2.71$, with direction of difference between high and low groups predicted.

**Strong prediction for the low group is indicated by Yes-High.

Significance of auditory and visual discrimination in the acquisition of reading skills is tabled as follows.

TABLE III

CHI SQUARE AND PHI COEFFICIENTS OF AUDITORY AND VISUAL DISCRIMINATION

Auditory Discrimination-isolated sounds	X^2 67.6	phi .46
Auditory Discrimination-initial consonant sound	X^2 112.4	phi .608
Visual Discrimination-matching words	X^2 101.6	phi .571

The items in Table III are extracted from Table II to emphasize the importance that auditory and visual discrimination bear to the acquisition of reading skills. It was noticed that auditory and visual discrimination as taught to the Experimental Group, significantly increased their performance on the Lippincott B test (see Table V). In addition, Group 1, Experimental, easily acquired 'oo' at the same time as 'o', without stress or confusion.

It was believed that given a greater length of instruction time that Group 1, initially the lower achievers, would have tested higher than Group 2, who had a larger percentage of good readers.

Post-Test Phase

A total of 250 completed the learning phase. The other fourteen persons were eliminated for reasons of incomplete data caused by illness, school transfers, and moving from the district.

The results of the Reading Achievement Tests are included in Table IV.

TABLE IV

A COMPOSITE OF CORRELATION COEFFICIENTS
AMONG READING ACHIEVEMENT TESTS
FOR GROUPS 1 AND 2*

C (2) E (1)		H.M.	LIP A	LIP B	LIP T
		.2659	.3739	.2280	.3139
			.5978	.5982	.6323
H.M.	.4704			.7883	.9392
LIP A	.5500	.5591			.9516
LIP B	.5097	.5216	.7400		
LIP T	.5664	.5777	.9230	.9419	

*All r's are significantly different from zero at the .05 level.

C (2) = Group 2, Control; E (1) = Group 1, Experimental.

The correlations for Group 1, read at the upper right hand portion of the matrix, are in many cases lower than corresponding correlations for Group 2, in lower left hand corner. This was expected as standard techniques and readers prepare for standard tests. The Mahon system prepares differently and advanced Group 1 in the Final test (see results, Table VI, p. 32)

Both groups achieved equally well as measured by the Metropolitan; Form A; Houghton Mifflin; and Lippincott Total (Forms A & B) in the post test phase. (See notes regarding standardized tests, Chapter V, p.p. 35 & 36.)

TABLE V

MEANS AND STANDARD DEVIATIONS OF SCHOOLS PARTICIPATING
IN READING ACHIEVEMENT TESTS

SCHOOLS			TESTS						
			METROPOLITAN		HOUGHTON-MIFFLIN		LIPPINCOTT TOTAL		
Number	Name	Group	Mean	S.D.	Mean	S.D.	Mean	S.D.	N.
01	J. Swift	1	79.50	4.95	22.00	0.00	134.00	2.83	2
02	A. Lincoln	1	75.54	10.78	19.36	2.57	104.09	27.55	11
03	J. A. Parker	1	67.32	9.33	18.55	2.34	90.64	21.70	31
04	Mt. Pleasant	1	76.31	10.48	18.08	4.09	92.38	23.14	13
05	Congdon	1	71.82	7.47	18.18	2.60	103.45	13.65	11
06	Kempton	1	73.19	7.64	19.13	2.87	108.38	22.08	16
07	Carney	1	74.08	11.37	20.75	1.29	113.17	18.16	12
08	T. Rodman	1	66.64	10.04	21.09	1.04	128.55	9.23	11
09	E. Hathaway	1	75.93	7.72	20.67	1.18	120.06	12.14	15
10	E. C. Brooks	1	67.00	6.96	18.00	2.97	107.50	22.33	6
11	Clark Street	2	76.00	8.37	17.50	2.07	81.33	17.90	6
12	Dunbar	2	71.60	7.57	18.40	3.78	107.30	16.97	10
13	Winslow	2	67.17	5.27	20.00	1.10	109.17	13.18	6
14	Knowlton	2	73.00	9.81	19.43	2.85	88.07	26.33	28
15	Phillips Ave.	2	81.63	6.78	20.13	2.30	112.63	19.26	8
16	Taylor	2	74.17	9.55	19.33	2.07	110.17	11.02	6
17	Campbell	2	77.43	8.41	19.71	1.27	111.14	18.01	14
18	C. Ashley	2	66.63	8.05	18.11	2.67	102.00	11.20	8
19	S. Ottiwell	2	70.78	12.54	19.61	2.03	101.61	18.14	18
20	Clifford	2	67.39	8.66	17.39	3.36	98.78	19.03	18

The results of the post-test following diagnosis and training revealed the value of the phonic approach in that the Experimental Group scored significantly higher in the Lippincott B post-test (see Table VI).

TABLE VI

STATISTICAL TEST RESULTS: SUMMARY OF t TESTS OF DIFFERENCE BETWEEN MEANS OF GROUPS IN READING ACHIEVEMENT TESTS

MET	H.M.	LIP A	LIP B	LIP T	N.
-.4027	.5015	.2850	2.143*	1.0663	250

*Significant at the .05 level at 248 degrees of freedom with a one-tailed test; all others not significant.

Table VI shows significant results in the Lippincott B Test, which tests more advanced concepts.

As a result of the random assignment of schools it was observed that a majority of good achievers fell into the Control Group. Therefore, although there were few significant differences between the test results of the two groups, it is proposed that in view of the difference in the Lippincott B results, that over a longer period of instruction the post-test results might have shown greater differences in other tests for the Experimental Group.

All t statistics are positive, except for the MET, indicating better achievement for Group 1, with the Lip B t statistic significant. The decrement shown in the MET statistic, indicating better achievement for Group 2 can be explained by the differences in preparation/instruction and the fact that more pupils with greater reading difficulties were in the Experimental Group. Actually these conditions add to the interesting

TABLE VII

E (1) SIGNIFICANT INTERITEM CORRELATIONS (r 05) OF KINDERGARTEN SCREENING TEST FOR GROUPS 1 AND 2

N = 116 N = 134

C (2)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	M	SD
	1				1952							2175						2458					3134	4656
	2	2028																					5149	5010
	3				2817		2413										1779						6269	4854
	4			4795					2115														5224	5014
	5		331												1785								3881	4891
	6											2108						2009					6493	4790
	7				2510												2303						1716	3785
	8						2779			2831													7239	4487
	9				2282	1624	2070		5500			1759					1956						5522	4991
	10			2875	2643					2483		3326									2128		4925	5018
KINDER-	11	1887	3939											1678									3433	4766
GARTEN	12						2020		2692	3604	4196			1823									3955	4908
SCREENING	13															1897							3731	4854
TEST	14													3201				1755					2836	4524
	15											1893			3064		2527						3433	4766
	16														2465	3699							2239	4184
	17							2052															3657	4834
	18				1888			1978												5538	5749		4925	5018
	19										1974	1965						3920		5706	5279		4478	4991
	20																1856	4695	3326		7595		6269	4854
	21																2205	4835	3539	6481			6343	4834
	M	4052	3707	5862	4052	4483	8362	3448	7069	5437	3966	3793	3190	3621	2845	3191	1379	5086	4397	4655	6034	7411		.168
	SD	4930	4851	4946	4931	4995	3717	4774	4572	5003	4913	4873	4687	4827	4531	4681	3463	5621	4985	5010	4973	4398		r .182	05

factor of significant progress as measured in the Lip B Test.

In the Interitem Correlation Table VII (p. 33) some of the initial differences between Group 1 and Group 2 may be noted.

Summary

This investigation explored the possibilities of early diagnosis and prescriptive teaching at the kindergarten level as a preventative measure against reading failure.

It was found possible to attain this level of achievement with a carefully designed program within a school system using qualified, dedicated teachers to implement the instruction.

The presentation of data delineates the steps taken and offers supporting evidence of the results.

An important factor was the use of especially designed didactical materials, which improved the acquisition of reading skills for the experimental group.

In general, the kindergarten level proved to be a favorable time for early intervention.

CHAPTER V

ANALYSIS OF DATA

The hypothesis that was propounded at the beginning of this investigation has been largely substantiated by the statistical results. It is this writer's opinion that had the learning phase been extended the results would have shown significant differences in more of the measured areas. One foundation for this opinion is that standardized tests are based upon standard readers and instructional levels, while the Mahon system, initially, prepares the student in different ways. Some of these differences have been listed in Chapter III (pp. 20-22) and a detailed description is included in the Appendix. In addition, the standard tests and materials used are further delineated as follows:

The Slingerland Test: The contents include seven subtests grouped into three main categories of Visual; Visual-motor and Auditory skills.

The Kindergarten Screening Test: This test consists of twenty subtests as well as IQ and Identification Items under the main headings of Cognitive Functions; Visual-motor Coordination; Body Coordination; Visual Discrimination; Auditory Discrimination; and Social-Emotional Behavior.

The Metropolitan Reading Readiness Test (Form A): This test has seven subtests, namely Word Meaning; Listening; Matching; Alphabet; Numbers; Copying and Draw-a-Man.

The Houghton Mifflin Survey Test consists of four subtests: Using Context; Letter-Sound associations; Context; and First letter of a printed word.

The Lippincott Tests consist of Book A and Book B. Book A has ten subtests grouped under categories of Consonant Recognition; Word Recognition; Blends; Vowel Recognition; Word Completion and Comprehension. Book B has nine subtests under the headings of Sound Recognition; Syllabication; Word Recognition; Vowels and Digraphs; Sentence Comprehension and Paragraph Comprehension.

This battery of tests covers in detail the multiple beginning skills generally associated with the acquisition of reading.

Referring to the choice of research design, the Campbell and Stanley, Posttest control group design number six, the internal validity is controlled for History; Maturation; Testing; Instrumentation; Regression; Selection; Mortality; Interaction of Selection and Maturation. The external validity is controlled for Interaction of Testing and X;

R X O_1[34]
R O_2

This design takes places through Times 1 - 6, and each Time will be discussed and commented upon where necessary (see Fig. 2, p. 25).

At Time 1, all kindergartners in the chosen site were screened for potential learning problems, with particular emphasis on the skill areas generally associated with reading.

At Time 2, those pupils who failed five or more test items were selected for this investigation regardless of the known IQ level of each pupil, that is, both High and Low IQ pupils were included if they failed five or more test items.

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[34]Donald T. Campbell and J. C. Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago: Rand McNally & Co., 1963), pp. 8-26.

At Time 3, the selected population was randomly assigned to either Group 1, Experimental or Group 2, Control. The sample population came from 20 different schools and were identified to the teachers in the listed schools (see Table I, p. 27).

Referring to Table I, it will be noted that numberwise there is a slight difference in the student population between the two groups. This initial difference came about because the schools were randomly assigned regardless of the number of reading failures in each one. However, by the end of the investigation the numbers were closer because of several pupils leaving the program due to personal or family reasons.

Time 4 began the specialized instruction of the Experimental Group. Each student in this program received half and hour of individualized instruction from the teacher's aide. The instruction was prescribed according to the individual need but all instruction was based upon the Mahon system of instruction. The Control Group received the instruction generally given at each school. The instruction varied according to the preferred system in daily use at each school.

Time 5 began the post-test period. Each pupil in the sample population received three achievement tests: the Metropolitan, Houghton Mifflin and Lippincott, Books A and B.

Between the end of Time 5 and the beginning of Time 6 there was a slight delay as not all of the teachers were able to complete their tests at the same time. The secretary to the project had to do a considerable amount of work to get all the test results returned and entered for statistical evaluation.

The cooperation of each building principal was mandatory to the eventual success of the data gathering. The cooperation and availability

of the teacher's aides also depended upon the motivation of each building principal and the teachers involved.

In the Learning Phase, Group 1 received instruction in the Mahon system of reading readiness and Group 2 received standard basal reader instruction.

In Tables II and III the high correlation of auditory discrimination with the early acquisition of pre-reading skills is clearly shown. Table II, p. 28, the Chi square tests reported are significant at the .05 level of significance. Phi coefficients indicate high to low strength of relationships in the same order as the chi squares.

Findings indicate that eight of the diagnostic subtests of the Kindergarten Screening Test have positive relationships with reading grades taken a year later. These subtests also have a characteristic property of predicting and therefore, also identifying those students who may fail in reading. The subtests useful for identification purposes are auditory, discrimination or words, perception reversals, draw-a-person test, chronological age, matching words, verbal fluency, Lorge-Thorndike deviation, intelligence quotient, and auditory discrimination of letter-sounds.

In Table II, p. 28, four of the eight subtests, with adjectival ratings of "Yes", "Yes-high" and "Yes-barely" have the added property of identifying students with potential reading disabilities. The subtests which may be used for identification purposes are (1) Auditory Discrimination of Words, (11) Perception-Reversals, (13) Draw-a-Person and (19) Chronological Age. These four subtests identify students with potential reading difficulties in contradistinction to those who score well in both diagnoses and reading.

It is interesting to note that Motor Coordination-Body (10)

although rated Low has been given much more significance in recent investigations and particularly in the works of Frostig[35], Valett[36] and in many current programs such as the CCC[37] commonly used in Spanish speaking countries.

Some of the components relevant to the acquisition of reading skills such as the IQ level of the pupil and the socio-economic background were noted but not compared with the post-test results which measured academic achievement in reading readiness techniques. A comparison of those pupils with over 100 IQ and thos of under 100 IQ in each group might have also enlightened us as to the learning process. However, at the time of the investigation emphasis was placed primarily upon early identification of potential weaknesses and the effectiveness of prescribed instruction.

It can be seen that in some instances Group 2 scored higher than Group 1 (Table IV, p. 30) although in the overall advancement Group 1 scored significantly higher in the Lippincott B Form which measures more mature concepts. As a majority of better readers were initially in Group 2, it is assumed that the teaching techniques for Group 1 were superior in order to gain this progress. Quad erat demonstrandum. After the post-

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[35]Marianne Frostig and David Horne, The Frostig Program for the Development of Visual Perception (Chicago: Follett Educational Programs, 1960).

[36]Robert E. Valett, The Remediation of Learning Disabilities: A Handbook of Psychoeducational Resource Programs (California: Fearon, 1967), Program No. 38.

[37]CCC Departmento de Educacion Especial, Curso de Adiestramiento y Maduracion Mental (Department of Special Education, Course of Training and Mental Maturity) (San Sebastian, Spain: 1973), pp. 34-37.

test data was completed it was computerized and processed by a team of research assistants. Specific and informative data is given in Tables IV, V, and VI, pp. 30-32, Chapter IV.

In Table VI, p. 32, it was substantiated that the Mahon system of training benefited the pupil from the close association between stimulus and response. The Experimental Group scored significantly higher in the post-test of the Lippincott B. The Lippincott B Test measures more advanced concepts and the Mahon system introduces the double vowel "oo" at the same time as the single vowel "o". Other differences are the close relationship between stimulus and response in all auditory and visual discrimination learning.

Summary

The statistical results clearly show that the Mahon system does make a difference in preparation for reading readiness as measured by the Lippincott B Test. It was also apparent that all standardized methods of reading readiness prepare equally for standardized achievement tests in beginning reading skills.

In all other results there were no significant differences between the two groups. One reason put forth is that the majority of failing readers in the lower percentile came into the Experimental Group through the initial random selection of the schools. Therefore, although greater progress may have been achieved by this group during the learning phase it was only revealed in the Lippincott B results.

It is possible that had the training continued over a longer period of time the gain scores in other areas would have been greater. Generally speaking, the Kindergarten Screening Test measured different characteristics than the Slingerland while the other achievement tests

contain similar components.

There is little doubt that the early identification and subsequent training aided both groups in the acquisition of skills basic to a successful reading program.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

The preceding chapters have covered the various aspects of an investigation made to assess the value of early identification followed by prescribed instruction as a preventative measure against reading failure. The prescribed instruction was carefully designed to strengthen weak or undeveloped skill areas associated with pre-reading skills. Emphasis was placed upon audio and visual discrimination as understood by sound and initial consonant discrimination and matching designs and, later on, words.

Through the recorded results one has been able to ascertain that early intervention, that is, at the kindergarten level, is a favorable time to isolate potential learning problems. The emphasis on screening for potential learning difficulties and then instructing the pupil in weak areas has shown to be beneficial to all students so treated (see post-test results, Chapter IV, Table IV).

The inclusion of bi-lingual kindergarteners in this research is particularly relevant because of the growing mobility of families in the United States and the current relaxation of immigration standards. It has been common practice to begin teaching English for bi-lingual students at later grade levels. However, in this investigation it was established that no emotional or cognitive confusion was experienced by the bi-lingual student included in this prescribed instructional program.

The kindergarten population of an urban area on the eastern seaboard was chosen initially because of the noticeable reading problems among the school population and for its combination of bi-lingual, namely Portuguese speaking families.

It was observed that the pupils who had been screened as potential reading failures were now able to function at grade level.

As recorded in Chapters IV and V, the investigation proceeded through phases one to six culminating in an accumulation of 61 variables for each pupil of the 250 final sample. Although not all of the variables were explored statistically those presented herein support the following conclusions.

It was noted that those pupils who had been screened as potential reading failures were achieving grade level work after instruction. Therefore, it is offered that the kindergarten level is a favorable time in which to begin preventative measures and build up weak areas in skills needed for the acquisition of reading readiness.

It is offered that in view of the earlier maturation of the infant that a closer look be given to the content of kindergarten programs in general. For some time, dissatisfied parents have accepted the 'play therapy' atmosphere of some programs while ventilating their concern that this was not meeting the needs of the young child - product of today's society. It is proffered that this area of concern may be explored by Teacher Training Institutes and teachers certified in Early Childhood education.

The Kindergarten Screening Test was revised as a by product of the investigation and the revised material can be found in the Appendix (see p. 70). It was found that eight of the test items were highly

diagnostic and four of these were clearly predictable as to future performance, refer to Table II, p. 28.

Test data and relevant information amounted to 148 items for each pupil completing the program. Most tests and teaching materials used had been standardized with the exception of the Kindergarten Screening Test and the Mahon system of instruction. It was anticipated that these materials would become standardized by comparative statistics and by wider application and use.

At the end of six month's training each pupil received a battery of tests in order to measure progress. The screening tests included the Metropolitan Readiness, Form A; Houghton Mifflin and Lippincott Achievement Tests (for a complete description refer to p. 26)

Particular attention must be given to the facts that at the kindergarten level the pupil is usually more flexible and more viable to receive instructional correction also that an early introduction into the mechanics of reading does not confuse or develop emotional reactions among kindergarteners.

The teaching techniques used with the Experimental Group are referred to, in this investigation, as the Mahon system. This appellation is to distinguish these techniques from those used in common practice. The system consists of a sequential pattern of exercises based upon a phonic approach with emphasis on the relationship between stimulus and response and were developed conjointly with the professional personnel working with the Experimental Group. This system, described in Chapter III (see pp. 20-22), and in the Appendix (see pp. 54-61), was used effectively with both the slow learner and the bi-lingual pupil. The Mahon system appeared to enhance the transfer of training as measured by the

Lippincott Test, Form B, which measured more mature concepts.

The t test of difference (see Table VI, p. 32) indicates, through the substantial advance made by the Experimental Group 1, that it is beneficial to introduce the 'long vowel' at the same time as the 'short vowel' without causing distress or confusion, providing it is introduced with close association between the stimulus and response.

It can be acknowledged that insightfully developed programs with skilled, qualified teachers to implement these programs are an ongoing need in kindergartens throughout the United States.

Interdisciplinary acceptance and support from the faculty and staff of this chosen school population made the difference between the academic success or failure of the pupils involved. Without the full cooperation of the personnel in each public school listed (see p. 27), it would not have been possible to conclude this program successfully. The additional use of teacher aides as instructors was innovative and relieved the classroom teacher while apparently benefiting the pupil.

It is proposed that educators may increasingly find in the kindergarten the optimal time and place to begin further studies into preparation for preventative reading programs.

Although there may be similar studies currently in operation there were no identical investigations at the time this research was initiated.

This design proved effective, innovative, and gave every indication of fulfilling its purpose which was later supported by statistical data and results as described in Chapter IV.

At the time of its inception it was the only program to identify weak areas and then to instruct and build up those skills directly related

to the acquisition of reading. All other researched studies either identified specific programs, taught only in isolated areas or tested the efficacy of standard items. This investigation was original in that it used the combination of early identification and prescribed instruction based upon those identified weak areas. With exemplary dedication on the part of the teaching personnel involved a successful conclusion was attained, namely the grade level performance of former diagnosed 'reading failures'.

Recommendations

Many current kindergarten programs emphasize social-emotional adjustment along with Piagetarian concepts of cognitive development. It is suggested that there is a readiness and an ability for young children to absorb instruction of a formal, sequential nature with attention to direct stimulus-response pattern as used with the Experimental Group. Therefore, pre-reading skills covering the following areas may be taught without creating stressful situations:

1) Visual recognition of the letter configuration.
2) Discrimination of one letter configuration from another.
3) Listening recognition of the acoustic sound represented by the letter learned through visual configuration.
4) Audio-discrimination of the acoustic letter sound.
5) Association of the acoustic letter sound with the visual recognition.
6) Progression of blending letter sound and visual recognition into one syllable words.
7) Learning the proper arrangement of letter sounds in given words.

It is also suggested that the content of most kindergarten programs needs reviewing with regard to the amount and type of pre-reading training given, based upon individually diagnosed needs.

This level of teaching may well employ phonics, but phonics used in conjunction with the techniques explored in the investigation will prove to be more effective than phonics used in isolation.

The cooperation of the supervisory school personnel must be enlisted in order to create a flexible and individualized climate of instruction.

Although any program may be considered good if the pupil appears to be well adjusted, there is much more that can be done for the kindergartener. During the first years of schooling, a careful diagnosis can expose many weak areas of achievement. Subsequently, those areas may be strengthened by appropriate instruction thus laying the groundwork for future academic achievement.

Since this investigation - at the time of its inception - was unique by reason of its early diagnosis followed by prescribed instruction, it is proposed that further studies be initiated in varying economic and geographic locations to support the findings.

The ramifications of incorporating such a program in bi-lingual and/or culturally deprived areas could be dramatic providing the following points are consistently and carefully covered:

1) All children should receive adequate screening for potential learning difficulties.
2) Instruction (individual) should be directly related to identified problem areas.
3) Professional and para-professionals must be trained in

individual instruction and interpretation of learning problems.

4) Cooperation of supervisory personnel is mandatory.

5) Instruction in the preparation of relevant practice materials should be available.

6) Post instruction testing for evaluative purposes is mandatory.

This new approach to reading problems can be a preventative measure against reading failure when properly carried out. It is hoped that there will be some replication.

APPENDIX

KINDERGARTEN INVESTIGATION
CODE KEY: CARD 1

	Item	Spaces	Field
1.	Identification number of pupil	3	1 - 3
2.	Group, Experimental or Control	1	4
3.	School, Random number	2	5 - 6
	Blank	1	7
4.	Last name of pupil	12	8 -19
	Blank	1	20
5.	First name & middle initial	11	21 -31
	Blank	1	32
6.	Sex	1	33
	Blank	1	34
7.	Slingerland Test		
	Visual	2	(35)-36
	a. I. Visual discrimination of letter forms	2	(35)-36
	b. II. Visual discrimination of word forms	2	(37)-38
	c. III. Visual perception memory	2	(39)-40
	Visual-Motor		
	d. IV. Copying	2	(41)-42
	e. V. Visual perception memory	2	43 -44
	Auditory		
	f. VI. Auditory discrimination	2	(45)-46
	Letter Knowledge		
	g. VII. Alphabet	2	47 -48
	Blank	1	49

KINDERGARTEN INVESTIGATION
CODE KEY: CARD 1 (cont.)

Item	Spaces	Field
8. Mahon Test		
a. Cognitive Functions		
I. DIQ 1=plus = 95 and over, score 1	1	50
0=minus = 94 and below, score 0	1	51
II. Verbal Fluency		
III. Writing name (first or first and last with letters in sequence and no omissions)	1	52
IV. Writing numerals (up to number 8 in sequence)	1	53
V. Following directions (are 3 of the 4 directions followed correctly)	1	54
b. Visual Motor Coordination		
I. Copying designs (standard)	1	55
II. Copying designs (advanced)	1	56
III. Copying letters and numerals (8 of 9 to be reproduced with good closure, form, direction and proportion)	1	57
IV. Copying words	1	58
V. Reversals of letters or numerals (absent)	1	59
VI. Eye-hand coordination	1	60
c. Body Coordination (on 9 items)	1	61
d. Visual Discrimination		
I. Matching designs (4 out of 5 correct	1	62
II. Matching words (with no others (marked)	1	63
e. Auditory Discrimination		
I. Discrimination of letter sounds	1	64
II. Discrimination of words identified by sound or initial consonant	1	65
f. Social-Emotional		
I. Body Image (single score)	1	66
II. Dependency (a,b,c)	1	67
III. Withdrawal (d,e)	1	68
IV. Frustration tolerance (f)	1	69
V. Aggression (g)	1	70
VI. Attention span (h,i)	1	71
Blank		72-79
9. Card number	1	80

KINDERGARTEN INVESTIGATION
CODE KEY: CARD 2

	Item	Spaces	Field
10.	Identification number of pupil (repeat item #1 for Card 2)	3	1 - 3
11.	Group, Experimental or Control (repeat item #2 for Card 2)	1	4
12.	School, random number (repeat item #3 for Card 2)	2	5 - 6
	Blank	1	7
13.	Metropolitan Readiness Test: Form A		
	a. Word meaning (0-16)	2	8 - 9
	b. Listening (0-16)	2	10 -11
	c. Matching (0-14)	2	12 -13
	d. Alphabet (0-16)	2	14 -15
	e. Numbers (0-26)	2	16 -17
	f. Copying (0-14)	2	18 -19
	g. Draw-a-man (0=E, immature; 1=D, below average; 2=C, average; 3=B, above average; 4=A, superior)	1	20
	Blank	1	21
14.	Houghton Mifflin Survey Test		
	a. Test I Using Context and Letter-Sound Associations (0-13)	2	22 -23
	b. Test II Context and first letter of a printed word (0-9)	1	24
	Blank	1	25
15.	Lippincott		
	Book A		
	I. Consonant Recognition		
	a. Initial (0-8)	1	26
	b. Terminal (0-8)	1	27
	II. Word Recognition: Initial Sound Clues (0-8)	1	28

KINDERGARTEN INVESTIGATION
CODE KEY: CARD 2 (cont.)

		Spaces	Field
III.	Blends		
	a. Initial (0-8)	1	29
	b. Terminal (0-6)	1	30
IV.	Vowel Recognition		
	a. Rhyming Words (0-5)	1	31
	b. Missing Vowels (0-5)	1	32
V.	Word Completion (0-7)	1	33
VI.	Comprehension		
	a. Sentence (0-6)	1	34
	b. Completion (0-7)	1	35
Blank		1	36
Lippincott Book B			
I.	Sound Recognition		
	a. Initial Consonants (0-6)	1	37
	b. Initial and Terminal Blends (0-9)	1	38
II.	Syllabication (0-20)	2	39 -40
III.	Word Recognition		
	a. Picture Clues (0-14)	2	41 -42
IV.	Vowels and Digraphs		
	a. Word Recognition (0-4)	1	43
	b. Word Completion (0-4)	1	44
V.	Sentence Comprehension (0-5)	1	45
VI.	Paragraph Comprehension		
	a. Written (0-5)	1	46
	b. Oral (0-5)	1	47
Blank		1	48
16.	Test Aggregate (total of 3 tests)	3	49 -51
Blank		1	52
Card #2		1	53

A COMPARISON BETWEEN THE METHODS USED BY MAJOR READING SERIES AND THOSE USED IN THIS INVESTIGATION

Major Reading Series	Mahon System
Alphabet Names vs. Sounds	
1. Alphabetic letter names are taught first. Comment: Reading is <u>not</u> a process of combining letter names to form words but rather it is the combinations of <u>sounds</u>. In order to arrive at the sound represented by a letter name, the child must eliminate the vowel in the letter name from his auditory reception and then attempt to produce the sound. Example: The name of the letter "l" is "el" and the sound is "l-l". The child must eliminate the initial vowel sound in learning the sound represented by "l". Letter names for c- g- h- q- w- x- y- ch- th- and wh- do not relate to their corresponding sounds.	1. Sounds are taught first and letter names later when the child has mastered the first steps in reading. Comment: This is accomplished by a speech-oriented program where sounds receive identifying names, such as "the puffing sound", "the buzzing sound", etc.

Major Reading Series	Mahon System
Configuration of Letter Association with Stimuli: Word Clue vs. Mouth Set	
2. The configuration of the letter is taught for recognition by superimposing it upon a picture. This picture illustrates a word whose initial sound is represented by the letter being taught. Some systems simply teach the names of the letters and their configurations by rote, or sandpaper repetition. Comment: Repetition and rote procedures omit the most important channel for the child to learn the association of stimuli. The superimposing of the letter symbol over a picture does have associative significance; however, the hindrances will be noted below under #3.	2. The configuration of the letter is associated with the sound which it represents. Comment: This is accomplished by the configuration of the letter serving as a clue to a mouth set which will produce the sound. Children with short auditory memories have difficulty in remembering the sound which is both tangible and abstract. Example: The configuration of "m" is superimposed upon the upper lip of the Indian girl in the illustration. "m" is produced by pressing the lips lightly together.

Major Reading Series	Mahon System
Sound-Symbol Association: Word Clue vs. Isolation	
3. A deductive approach is used. The sound to be heard (via letter name) is presented by means of a word clue. Example: The letter m is superimposed over an illustration of mice. Comment: Recent research indicates slower children learn better from an inductive rather than a deductive approach. They find it difficult to isolate the sound of m (to separate it from the rest of the word auditorially) and then to transfer the sound to another word such as mother.	3. Sounds are heard in isolation but only until they are identified by the child. Then they are heard in initial position in words. Example: m - alone. When identified readily by the child the sound is then used with a multiple selection of words beginning in m.

Major Reading Series	Mahon System
Development of Auditory Discrimination: No Clue vs. Visual Clue	
4. Through repetition alone the child is expected to develop auditory discrimination skills. Comment: If the sound is not clearly identified by the child to begin with, he is unable to discriminate it from other sounds. Ask him if "hot" and "top" begin with the same sound and he cannot tell you.	4. Auditory discrimination is channeled through visual clues, vis., mouth set. Comment: Auditory discrimination should follow visual assistance, not precede it, if there is an auditory deficiency. Visual channels provide a concrete basis for the illusive speech sound. Example: The child is asked if the words "hot" and "top" begin alike. He has learned that "hot" begins with the mouth open; "top" begins with the teeth closed. He is helped to "hear" the difference.

Major Reading Series	Mahon System
Left-to-Right Sequence: Inconsistent vs. Consistent Pattern	
5. The linguistic base for one-syllable words is not presented in left-to-right sequential order. Children are asked to identify initial and final consonants and vowels in random order.	5. Consonants are taught in initial position only, then with the vowel as a pivot. Final consonants are added last. Comment: The child who is seeking some organizational structure to the formation of words can learn the consonant-vowel-consonant linguistic pattern without confusion.
Grouping of Consonants and of Vowels: Intermingled vs. Discrete	
6. Consonants are not learned in a group but rather as a series of groups with vowels intermingled.	6. Consonants are learned as one entire group found in initial position at first with vowel added next. Left-to-right sequence is preserved for the child. With the pattern of the vowel as a pivot he has no difficulty in seeing how "pan" can become "plan".

Major Reading Series	Mahon System
Recognition of Vowel Sound: Word Clue Alone vs. Word Clue with Identifying Gesture	
7. Vowels are presented by means of word clues with no assistance for the child to isolate the sound. Comment: The short vowel a begins the word "apple" which serves as a clue. The slow-learning child cannot isolate the sound of short a from its integration with other sounds in the word "apple" any more than he could isolate consonant sounds for identification and discrimination.	7. Word clues are used for the identification of short vowels because a vowel sound can be prolonged in articulation whereas a consonant sound usually cannot. This prolongation in speech production of a vowel helps the child to "hear" it. However, he needs help in isolating the sound for use in other words. The separation of the vowel sound from its word clue is accomplished by means of a kinesthetic approach, i.e., a gesture. The child says the whole word clue and then begins to say the word again. He is stopped by a gesture after uttering the vowel. Thus he is able to hear it and reproduce it.

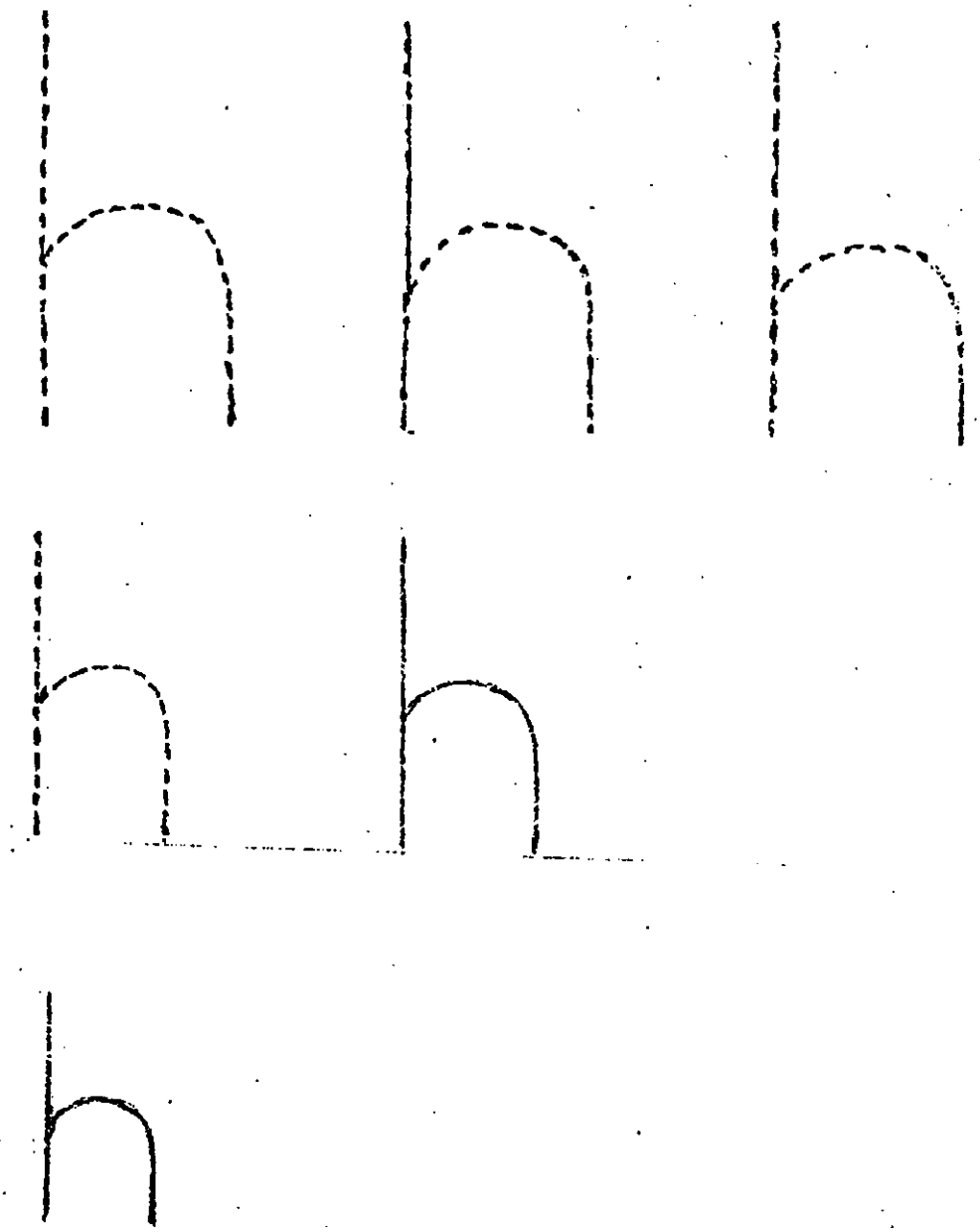
Major Reading Series	Mahon System
Memory for Vowel Sounds: Without vs. With Associative Stimuli	
8. The child is expected to discriminate short vowel sounds by means of word clues alone. Comment: The slow-learning child has difficulty remembering the vowel sounds attached to word clues.	8. Vowels are printed in the child's workbook and on practice sheets. The color of the vowel evokes the word clue. Example: Red a evokes the word clue "apple", yellow e evokes the word clue "egg", etc.
Blending: Without vs. With Support	
9. Blending is assumed to be a matter of "saying the letter sounds fast". Comment: Blending is a highly specialized skill and difficult for the slow-learning child. It cannot be learned by "saying the sounds fast".	9. Blending is taught by supporting the child in the initial stages. The vowel is first combined with a consonant that is a continuant such as m, n, f, etc. Then by means of a chart the child combines the other consonants with the vowel by means of rhyming. Plosives are learned last.

Major Reading Series	Mahon System
Rules for Vowels: Complex vs. Simple	
10. Rules for vowels are not presented in the least common denominator. Rules for "magic e" digraphs, etc. are taught separately.	10. Use of vowels is simplified into one rule for one-syllable words: when there is one vowel it is usually short; when there are two the first has its alphabet name. This is accomplished by means of a delightful story about the little rabbit and Mrs. Alphabet.

SAMPLE WORKSHEETS FOR EXPERIMENTAL GROUP

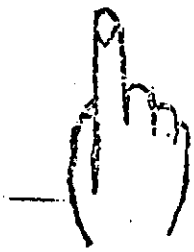
Cut out the letter on the back cover that fits over the hand

Fold up on the dotted line.
Staple sides to form pocket to store cut-out h
Practice fitting this cut-out often as you proceed with other letters.



NAME _____

Circle the letter that looks like the hand



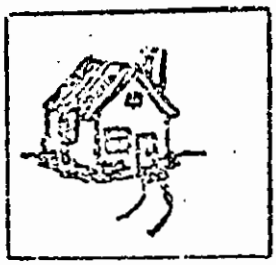
h h h

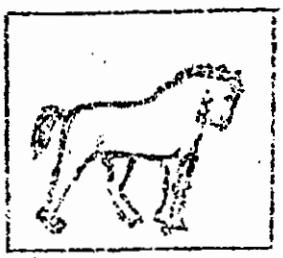
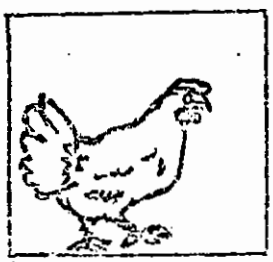
p h h p

h h f h

NAME _____

Name picture; print h.....

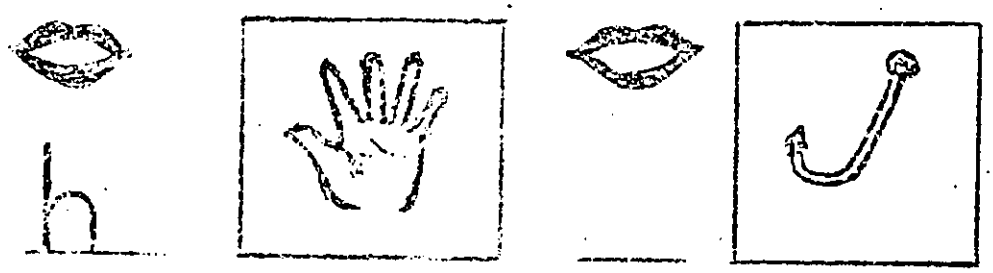
h  _____ 

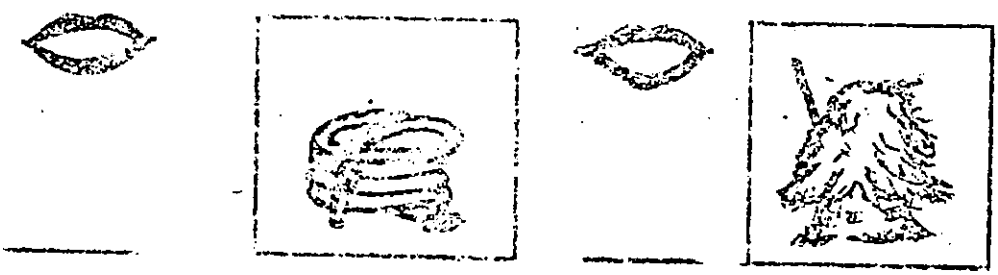
_____  _____ 

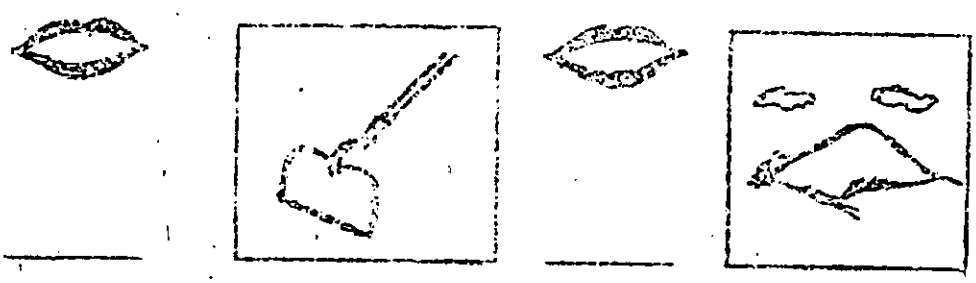
_____  _____ 

NAME _____

Name pictures; notice beginning huffing sound. Color lips to show how the huffing sound is made. Print h.



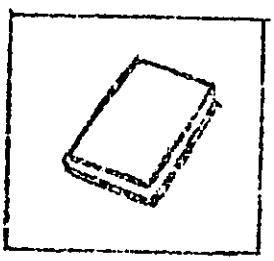


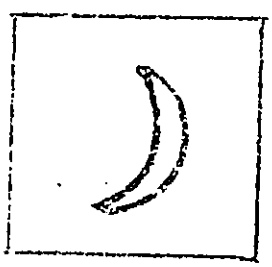


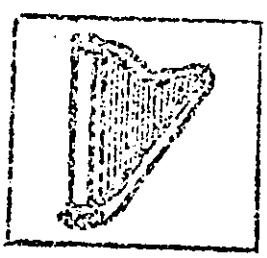
NAME _____

7.

Print h only beside the pictures whose names begin with the huffing sound.

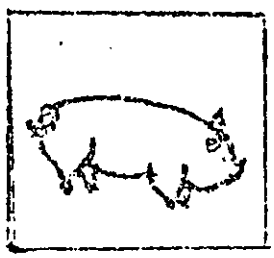


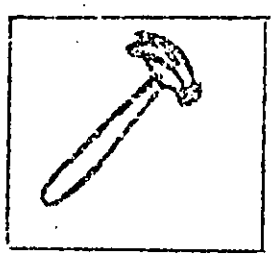


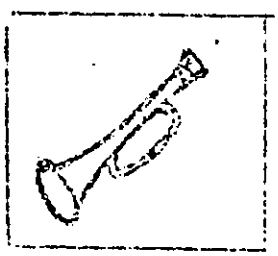


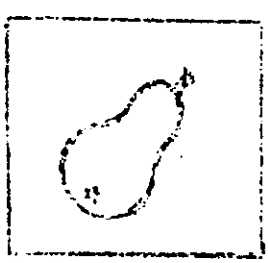
NAME _____

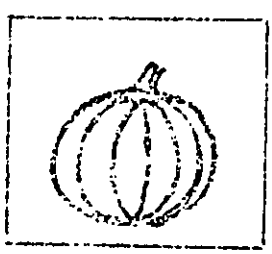
Print p or h beside the pictures to represent the beginning sound for each picture.











3.

Circle the word that begins with h

hat	pal	hen
sit	hut	tag
his	hum	jug
ham	ran	cot
fig	bit	hot

NAME _____

Primary Form
KINDERGARTEN SCREENING TEST
Revised Edition

(For diagnosis and prediction of reading disabilities) By

Florence L. Mahon, Ed D. (c)

Name..... School.....

Chronological Age..... ....

Date of screening test: Year Month Day

Date of Birth:

Chronological Age:

Preschool Status: Attended Preschool classes _____ Yes _____ No
Non-English Speaking Status: In this country less than one year_____Yes _____No
Vision: _____Yes _____No Hearing: Good, _____Yes _____No

Summary of Scaled Scores

A. Reception (input)
   1. Auditory... _____
      (1a +1b) SS
   2. Visual
      a. Matching 14
      (reversals) _____
      b. Sequence 12
B. Association
   1. Auditory and Visual 10
      a. Letter-
         sounds _____ 8
      b. Words _____
C. Verbal Ability 6
   1. DIQ _____
   2. Verbal Fluency 4
      _____
   3. Comprehension 2
      _____
D. Expression (output)
   1. Articulation _____
   2. Name _____
   3. Numeral _____
   4. Eye-hand coordiantion _____
   5. Body coordination _____
   6. Draw-a-man _____

Input										Output	
A 1	A 2a	A 2b	B a	B b1	C 2	C 3	D 1	D 2	D 3	D 4	D 5	D 6

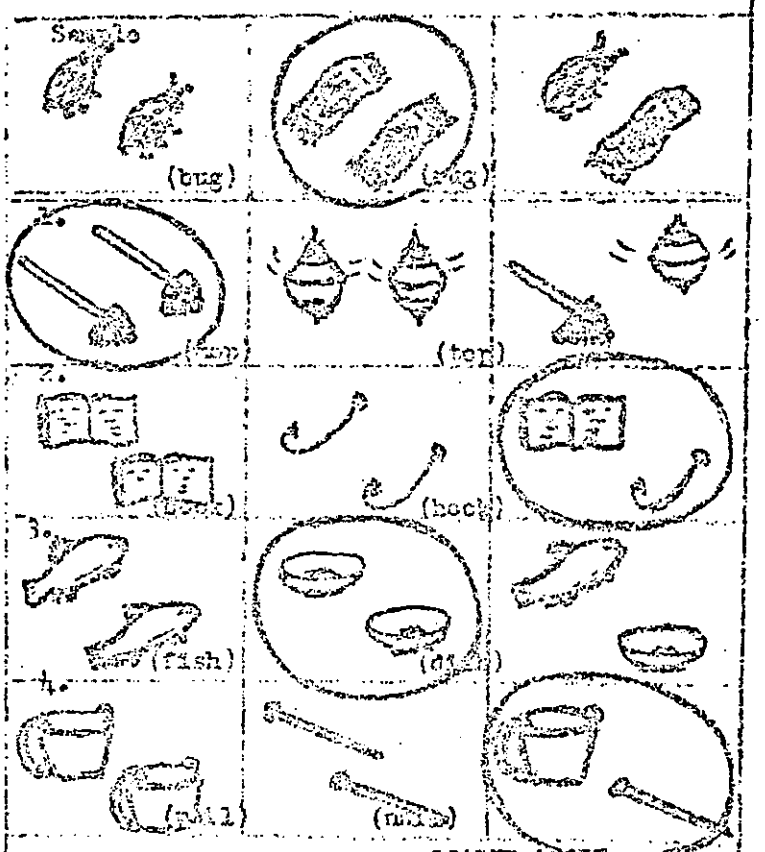
(circle R for reversals)

AUDITORY DISCRIMINATION

Initial Consonants

2.

TEST A - 1a



RAW SCORE
One point for each correct answer.

SCALED SCORE _____
(RS = SS)

ADMINISTRATION:

Have the student use a MARKER under each line.

The teacher will present orally the names of the objects in each row before giving the instruction for each row. (Ex. "The first picture shows bug- bug; the second picture shows rug- rug; the third picture shows bug- rug)

The teacher will instruct the student to circle the objects that are together in the same picture as she gives one combination in each row. Do not repeat combination to circle.

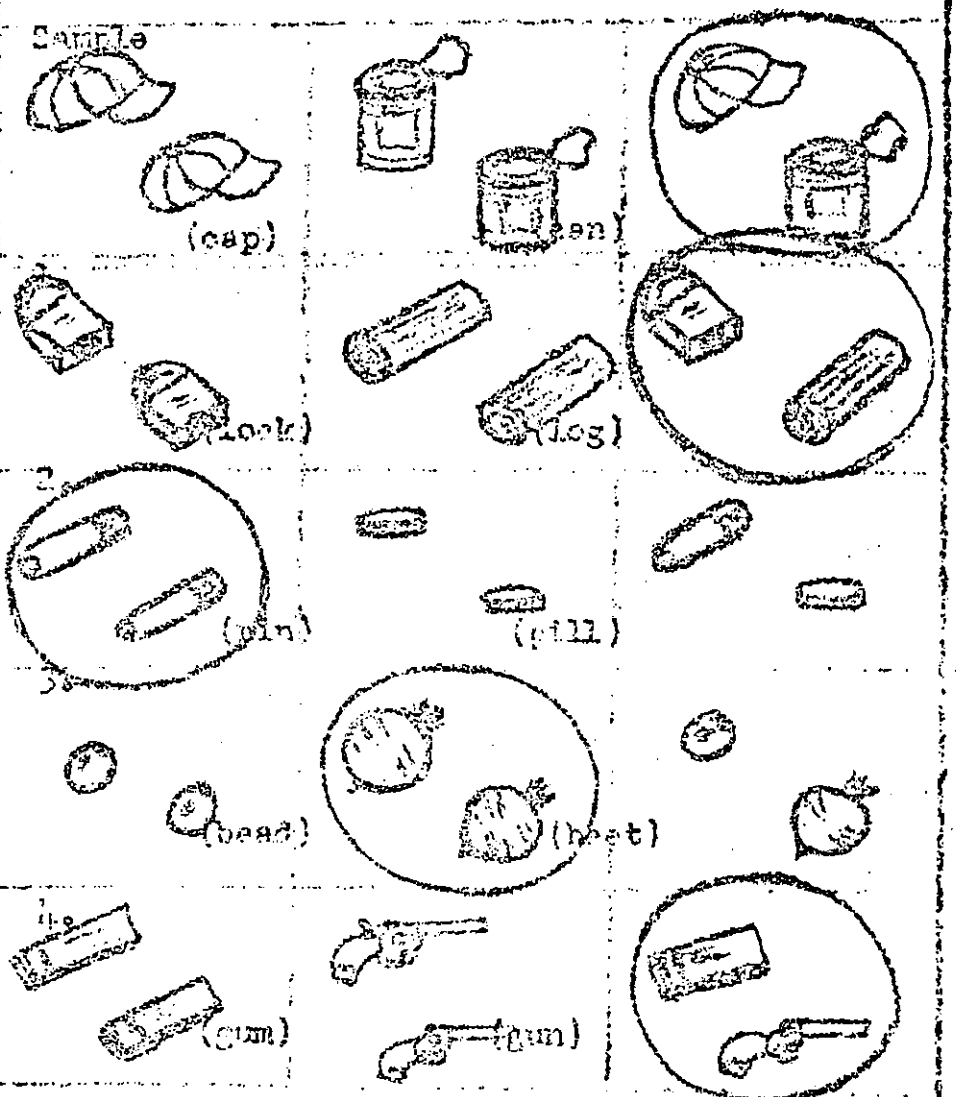
SAMPLE row is for practice.

RAW SCORE equals SCALED SCORE. Add to SCALED SCORE for TEST A - 1b.

AUDITORY DISCRIMINATION

Final Consonants

TEST A- 1b



RAW SCORE _____
One point for each correct answer.

SCALED SCORE _____
(RS = SS)

TOTAL SCALED SCORE
TEST A- 1a + TEST A- 1b _____

ADMINISTRATION:

Follow the same instructions as for TEST A- 1a.

TOTAL SCALED SCORE is the combination of SCALED SCORE TEST A- 1a and SCALED SCORE TEST A-1b.

VISUAL DISCRIMINATION

(Matching)

4.

TEST A- 2a Sample			
2	(2)	5	S
1. 5	2	(5)	3
2. 4	7	⊬	(4)
3. 3	(3)	ε	S
4. 6	9	(6)	d
5. n	u	(n)	r
6. Y	(Y)	Y	٨
7. p	b	(p)	9
8. K	⊁	K	(K)

RAW SCORE ____ One point for each correct answer

SCALED SCORE ____ (RS = SS)

ADMINISTRATION:

Have the student use a MARKER under each line. The student will circle the numeral or letter in the last three columns that matches the numeral or letter in the first column.

Line labeled SAMPLE is practice line.

SCORING: Raw Score equals Scaled Score.

VISUAL DISCRIMINATION OF SEQUENCE IN NUMERALS AND WORDS

5.

TEST A - 2b

Sample			
23	32	(23)	22
1. 76	(76)	77	67
2. 41	14	44	(41)
3. 985	(985)	589	895
4. 338	833	(338)	388
5. dog	(dog)	bog	dug
6. nut	unt	tun	(nut)
7. jig	gig	(jig)	jog
8. fat	(fat)	fit	tat

RAW SCORE 1-4 ___ SCALED SCORE 1-4 ___
RAW SCORE 5-8 ___ SCALED SCORE 5-8 ___
TOTAL RS 1-8 ___ TOTAL SS 1-8 ___
One point for ~~each~~ correct answer (RS = SS)

ADMINISTRATION:

Have the student use a MARKER under each line. The student will circle the numeral or word in the last three columns that matches the numeral or word in the first column.

Line labelled Sample is practice line.

SCORING: Raw Score for 1- 4 (Numerals) equals Scaled Score.
Raw Score for 5- 8 (Words) equlas Scaled Score.
Total Raw Score 1- 8 equals Total Scaled Score.

AUDITORY AND VISUAL DISCRIMINATION OF LETTER SOUNDS 6.

TEST B- 1a

Sample	S	(c)	z
1.	(r)	n	v
2.	(n)	m	r
3.	f	(v)	t
4.	(j)	g	ch
5.	d	p	(b)
6.	ch	(sh)	wh
7.	f	t	(d)
8.	wh	t	(th)

RAW SCORE _____
One point for each correct answer

SCALED SCORE _____
(NS = 30)

ADMINISTRATION:

Have the student use a MARKER under each line.
The child will circle the letter(s) identified by the corresponding sound presented orally by the teacher:

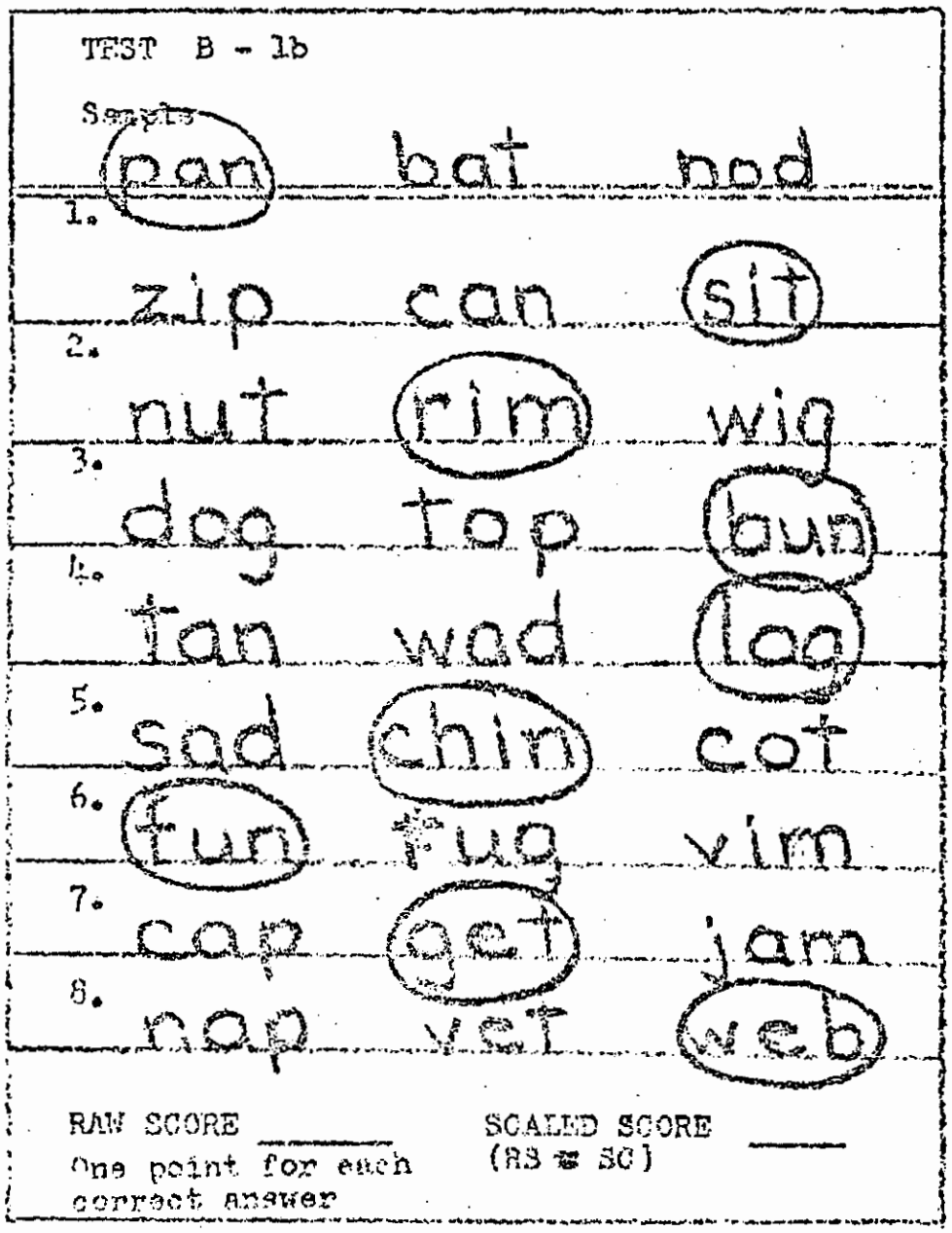
Practice: c
Line 1: r
Line 2: n
Line 3: v
Line 4: j
Line 5: b
Line 6: sh
Line 7: d
Line 8: th

Repeat each sound at least once.

SCORING: Raw Score equals Scaled Score

AUDITORY AND VISUAL DISCRIMINATION
OF INITIAL CONSONANTS IN WORDS

7.



ADMINISTRATION:

Have the student use a MARKER under each line. The student will circle the word in each line identified by the word presented orally by the teacher:

Practice:	pan		
Line 1:	sit	Line 5:	chin
Line 2:	rim	Line 6:	fun
Line 3:	bun	Line 7:	get
Line 4:	log	Line 8:	web

Repeat each word at least once.

SCORING: Raw Score equals Scaled Score.

VERBAL ABILITY 6.

DIQ and Verbal Fluency

TEST C-1 RAW SCORE

Deviation Intelligence Quotient (DIQ) _____
(Lorge Thorndike Intelligence Test Level)
Administered May, 1971

SCORING: RAW SCORE ÷ 12 equals Scaled Score _____
(RS → SS)
(12)

TEST C - 2 Verbal Fluency RAW SCORE (not cumulative)

The student usually communicates in the following manner:

1. Practically noncummicative ..... 2 ____
2. With below average content and below average fluency ..... 4 ____
3. With adequate content but with below average fluency ..... 6 ____
4. With good content and average fluency ..... 8 ____
5. With good content and extreme fluency ..... 10 ____

SCORING: RAW SCORE equals SCALED SCORE ____

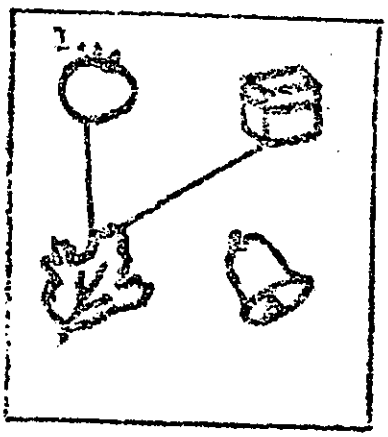
The teacher will complete the above catagory.

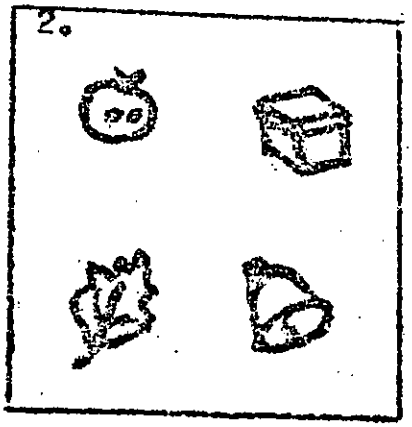
VERBAL ABILITY

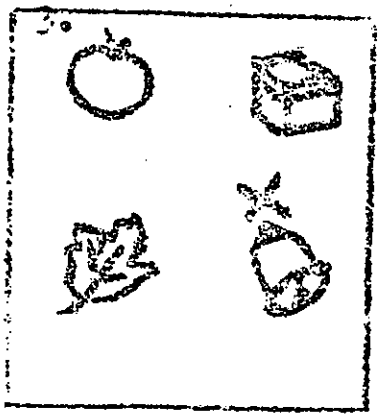
Comprehension - Following Directions

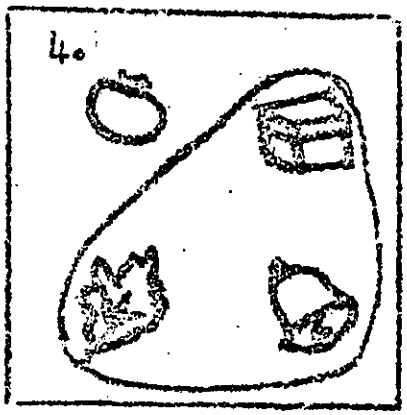
9.

TEST C- 3









RAW SCORE _____ (2 points each) SCALED SCORE _____
(RS = SS)

ADMINISTRATION:

The teacher will give the following directions orally for the child to follow. They may be repeated once: (Be sure the child knows the name of each picture.)

"In Box 1 draw a line from the picture of the apple to the leaf to the box."

"In Box 2 draw two dots inside the apple. Be sure they are both inside."

"In Box 3 draw a cross above the ball. Be sure it is not on the ball."

"In Box 4 draw one circle around everything except the apple. Be sure you make only one circle."

SCORING: Give 2 points for each correct response.
RAW SCORE equals SCALED SCORE.

EXPRESSION 10.

Articulation

TEST D- 1		RAW SCORE (cumulative)
(t)	Put the potatoes on the table.	____
(j)	Jack changed his orange.	____
(l)	It looks like a balloon or a ball.	____
(ch)	He was watching for the church.	____
ng) (zh)	The baby put his fingers on the television.	____
(sh)	She was washing a dish.	____
(r)	The rabbit ran around.	____
(v)	She had a velvet glove.	____
(th)	I think Mother made a birthday cake.	____
r blend)	Bring my present of crayons.	____
l blend)	Please paint the clock blue.	____
(s)	Sister likes the summer.	____
(z)	The zipper closes.	____
(st-wh)	Stop the wheel awhile.	____
(sk)	My scooter is near the desk.	____

RAW SCORE _____ SCALED SCORE _____

One point for each correct sentence

(RS = SS)

ADMINISTRATION:

The teacher will articulate each sentence clearly and the student will repeat the sentence. The teacher will note whether the student articulates the sound of the underlined letter in each sentence.

SCORING: One point is given for each correct sentence. The teacher may repeat the sentence if necessary.

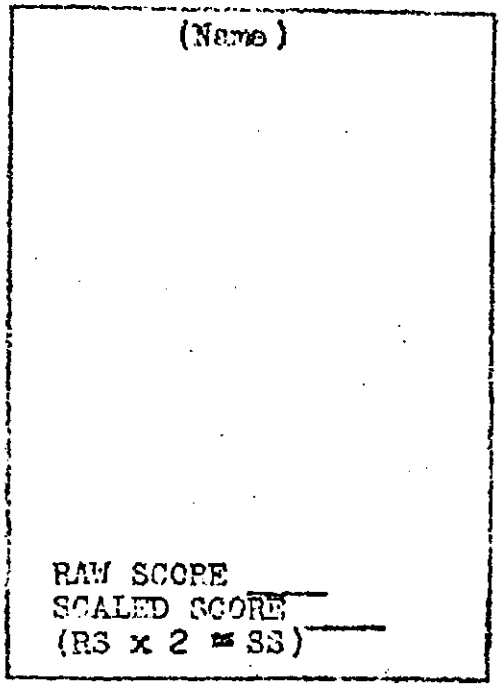
RAW SCORE equals SCALED SCORE.

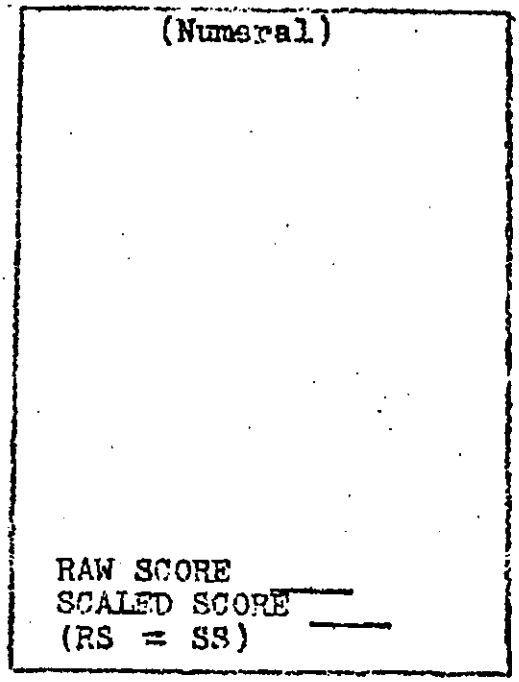
EXPRESSION

Writing Name and Numeral

11.

TEST D- 2 and TEST D- 3





(Reverse side of page)

ADMINISTRATION:

Have the student print his name on one side of the page.
Have the student write numerals in order beginning with one on the reverse side of the page.

SCORING: Name RAW SCORE: Give four points up to and including four letters if complete first name is printed. Give one point for each correct letter beyond four if they are in the right sequence.

RAW SCORE times 2 equals SCALED SCORE.

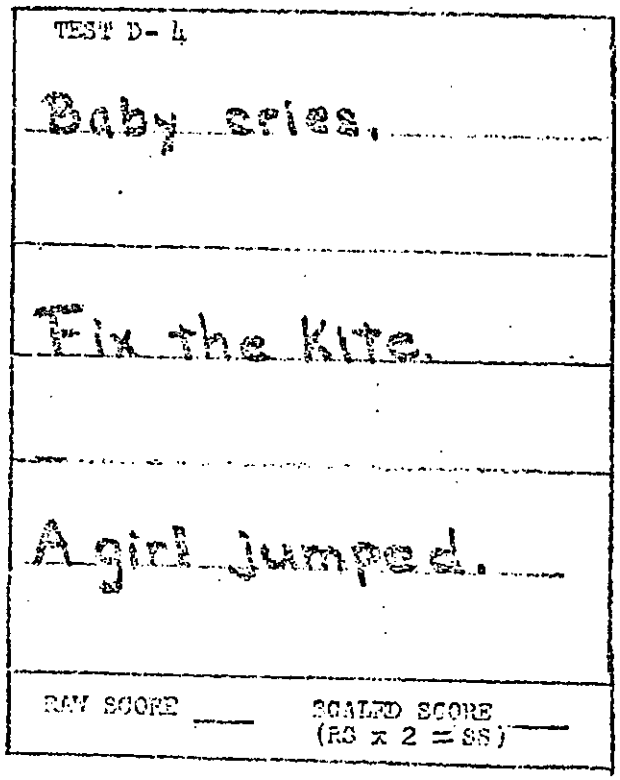
Numerals RAW SCORE: Give one point for each correct numeral if they are in the right sequence.

RAW SCORE equals SCALED SCORE.

EXPRESSION

Eye-hand Coordination 12.

TEST D- 4



RAW SCORE ____ SCALED SCORE ____
(RS x 2 = SS)

ADMINISTRATION:

Have the child copy the words below the given words.

SCORING: Give one point for each of the following:
RAW SCORE is cumulative.

Does the student:	RAW SCORE (Cumulative)
1. Make all lines without wavering?	____
2. Make all closures without noticeable overlapping?	____
3. Stay on the line as a rule?	____
4. Complete each sentence without going off the page?	____

SCORING: RAW SCORE times 2 equals SCALED SCORE.

13.

EXPRESSION

Body Coordination

TEST D- 5

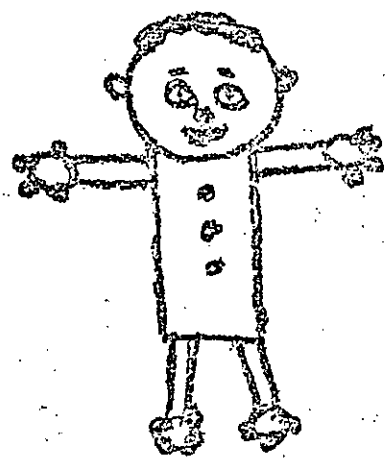
The teacher will give one point for each of the following accomplishments:

Does the child:	RAW SCORE (cumulative)
1. Skip using feet alternately?	_____
2. Hop on one foot?	_____
3. Balance standing on one leg for 10 '' eyes closed?	_____
4. Walk around room on tiptoe?	_____
5. Walk a straight line?	_____
6. Walk and stand with normal posture?	_____
7. Walk downstairs with alternate feet?	_____
8. Throw a ball at a target?	_____
RAW SCORE _____ SCALED SCORE (RS = SS)	_____

The teacher will complete the above data.

EXPRESSION
83
Draw- a- Man Test

TEST D-6 (Example)



RAW SCORE 16 SCALED SCORE 16
(RS = SS)

ADMINISTRATION:

Tell the student to "draw a man. Draw the best man that you can."

SCORING: RAW SCORE (cumulative) RAW SCORE

Give one point for each of the following body parts drawn:

Head	____
Eye or eyes	____
Nose	____
Mouth	____
Hair or hat	____
Trunk - two dimentional	____
Two legs	____
Two arms	____
Two legs - feet indicated ..	____
Two arms - hands or fingers indicated	____
Eyebrows	____
Ears	____
Pupils in eyes	____
Clothes	____
Two dimensional legs	____
Two dimensional arms	____
	____

RAW SCORE equals SCALED SCORE.

BIBLIOGRAPHY

Barsch, Ray H. "Perspectives in Learning Disabilities: The Vectors of a New Convergence." Journal of Learning Disabilities 1 (January 1968): 4-20.

Bateman, Barbara. "Three Approaches to Diagnosis and Educational Planning for Children with Learning Disabilities." Academic Therapy Quarterly 2 (Summer 1967): 215-21.

Bibace, Roger and Hancock, Karen. "Relationships Between Perceptual and Conceptual Cognitive Processes." Journal of Learning Disabilities 2 (January 1969): 19-31.

Bloom, Benjamin S. Stability and Change in Human Characteristics. New York: Wiley & Sons, 1964.

Campbell, Donald T. and Stanley, J. C. Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally & Co., 1963.

CCC Departmento de Educacion Especial. Curso de Adiestramiento y Madur-acion Mental (Course of Training and Mental Maturity). San Sebastian, Spain: CCC, 1973.

Chalfont, James C. and Scheffelin, Margaret A. Central Processing Dys-functions in Children. A Review of Research, Ninds Monograph No. 9 (Bethesda, Md., U.S. Department of Health, Education, and Welfare, 1969).

Chall, Jeanne S. Learning to Read: The Great Debate. New York: McGraw-Hill, 1967.

Clymer, Theodore and Barrett, Thomas C. Clymer-Barrett Prereading Battery. Princeton, N. J.: Personnel Press, Inc., 1967.

Cohen, Theodore B. "Prediction of Underachievement in Kindergarten Children." Archives of General Psychiatry. 9 (November 1963): 444-50.

Cruickshank, W. M.; Bentzen, Frances K.; Ratzenburg, F. H.; and Tannhauser, Mirium. A Teaching Method for Brain-Injured and Hyperactive Children. New York: Syracuse University Press, 1961.

deHirsch, Katrina; Jansky, Jeannette Jefferson; and Langford, William S. Predicting Reading Failure. New York: Harper and Row, 1966.

Delacato, C. H. The Diagnosis and Treatment of Speech and Reading Problems. Springfield, Ill.: Charles C. Thomas, 1964.

Durrell, Donald C. and Murphy, Helen. "The Auditory Discrimination Factor in Reading Readiness and Reading Disability." Education. 73 (1953): 556-60.

Dykstra, R. "Auditory Discrimination Abilities and Beginning Reading Achievement." Reading Research Quarterly.1 (1966): 5-34.

Edgington, Ruth. "Public School Programming for Children with Learning Disabilities." Academic Therapy Quarterly. 2 (Spring 1967): 166-69.

Office of Education (DHEW) Studies 1 and 2, Prediction of Achievement in the First Primary Year. Mo.: University City School District, 1970.

Engelmann, S. Preventing Failure in the Primary Grades. Chicago: Scientific Research Association, 1969.

Frostig, Marianne and Horne, David. The Frostig Program for the Development of Visual Perception. Chicago: Follett Educational Corp., 1964.

Frostig, Marianne; Lefever, D. W.; and Whittlesey, J. R. B. The Marianne Frostig Developmental Test of Visual Perception. Palo Alto, Calif.: Consulting Psychologists Press, 1960.

Green, Donald Ross. Educational Psychology. New Jersey: Prentice-Hall, Inc., 1964.

Haring, Norris G. and Ridgway, Robert W. "Early Identification of Children with Learning Disabilities." Exceptional Children. 33 (February 1967): 387-95.

Harkham, Laura D.; Gunning, Ann P.; and Waldron, Brother Cormac. "Multiple Prediction of Reading Achievement in Grades One Through Four Using Kindergarten Measures." Paper presented at the annual meeting of American Education Research Association, New York, 1971.

Harris, A. J. "Perceptual Difficulties in Reading Disability." IRA Conference Proceedings, 1961, 282-90.

Hellmuth, Jerome, ed.. Learning Disorders. Seattle, Wash.: Special Child Publications, 1965.

Hildreth, Gertrude H.; Griffiths, Nellie L.; and McGauvran, Mary E. Metropolitan Readiness Tests. New York: Harcourt, Brace and World, Inc., 1965.

Hilgard, Ernest R. and Bower, Gordon H. Theories of Learning. 4th ed. New Jersey: Prentice-Hall, Inc., 1975.

Ilg, Frances L. and Ames, Louise Bates. School Readiness. Harper and Row, Publishers, 1965.

Jackson, Miriam, ed. Developmental Test of Visual-Motor Coordination. Chicago: Follett Publishing Co., 1967.

Kephart, N. The Slow Learner in the Classroom. Columbus, Ohio: Charles E. Merrill Books, Inc., 1960.

Kirk, S. A. and McCarthy, J. J. The Illinois Test of Psycholinguistic Abilities: Experimental Edition. Urbana: University of Illinois, 1961.

Kirk, Winifred D. "A Tentative Procedure for Selecting Bright and Slow Children in Kindergarten." Exceptional Children 3 (December 1966): 234-41.

Koppitz, Elizabeth M.; Mardis, Verdine; and Stephens, Thomas. "A Note on Screening School Beginners with the Bender Gestalt Test." Journal of Educational Psychology 2 (April 1961): 80-81.

Krathwohl, D. R.; Bloom, B. S.; and Masie, B. B. Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook 2. Affective Domain. New York: Mackay Publishing Corp., 1964.

Lee, Doris M. and Allen, R. V. Learning to Read Through Experience. New York: Appleton-Century-Crofts, 1963.

McCullough, Constance M. and Tinker, Miles A. Teaching Elementary Reading. 3rd ed. New York: Appleton-Century-Crofts, 1968.

McKee, Paul; Harrison, M. Lucille; and Stroud, James B. A Pre-Reading Inventory. Boston: Houghton Mifflin Co., 1962.

McLoed, Pierce H. Readiness for Learning. Philadelphia, Penna.: J. B. Lippincott Co., 1965.

McNinch, George. Predictive Values of Selected Auditory Perceptual Factors in Relation to Measured First Grade Reading Achievement. Hattiesburg: University of Southern Mississippi, 1970.

Monroe, Marion. Readiness Aptitude Tests: Primary Form. Boston: Houghton Mifflin Co., 1963.

Morgan, Clifford T. and King, Richard A. Introduction to Psychology. New York: McGraw-Hill Book Co., 1966.

Olsen, Arthur V. and Rosen, Carl L. "Exploration of the Structure of Selected Readiness Tests." Paper presented at the annual meeting of American Education Research Association, New York, 1971.

Osgood, C. E. "The Similarity Paradox in Human Learning: A Resolution." The Psychological Review 56 (May 1949): 132-43.

Piaget, Jean. The Origins of Intelligence. New York: International Universities Press, 1966.

Rabinovitch, Ralph D. and Ingram, Winifred. "Neuropsychiatric Considerations in Reading Retardation." Reading Teacher 15 (1962): 433-38.

Russell, D. and Lea, H. R. "Research on Teaching Reading." Handbook of Research on Teaching. Gage, N. L., ed. American Education Research Association. Chicago: Rand McNally, 1963.

Slingerland, Beth H. Screening Tests for Identifying Children with Specific Language Disability, Pre-primary Form. Cambridge, Mass.: Educators Publishing Service, 1968.

Smith, Edward W.; Krause, Stanley W.; and Atkinson, Mark M. The Educators' Encyclopedia. New Jersey: Prentice-Hall, Inc., 1963.

Staats, Arthur W. and others. Learning and Cognitive Development: Representative Samples (Reading, Number Concepts, Writing) and Experimental Longitudinal Methods. Monograph. Honolulu: University of Hawaii, 1969.

Stutz, Sara. "Nuevos Horizontes para los Ninos Retrasados" (New Horizons for Retarded Children) Selecciones de Readers Digest Mexico: Readers Digest (March 1965): 61-64.

Tauber, Rosalyn. "Identification of Potential Learning Disabilities." Academic Therapy Quarterly 2 (Winter 1966-67): 116-19.

Taylor, Edith Meyer. Psychological Appraisal of Children with Cerebral Defects. Cambridge, Mass.: Harvard University Press, 1959.

Thomas, Althea P. "The Identification and Evaluation of Learning Disabilities by the Classroom Teacher." Academic Therapy Quarterly 1 (Winter 1965-66): 81-83.

Valett, Robert E. The Remediation of Learning Disabilities: A Handbook of Psychoeducational Resource Programs. California: Fearon, 1967.

Wepman, J. M. "Auditory Discrimination, Speech and Reading." Elementary School Journal 60 (1960): 325-33.