Study comparing results obtained with the Clymer-Barrett prereading battery for two groups of five year old kindergarten pupils

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A STUDY COMPARING RESULTS OBTAINED WITH THE CLYMER-BARRETT
PREREADING BATTERY FOR TWO GROUPS OF FIVE
YEAR OLD KINDERGARTEN PUPILS
(Pupils in their first year of kindergarten compared with another group in their second year)

by
Trude Voss

A RESEARCH PAPER
SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS IN EDUCATION (READING SPECIALIST)
AT THE CARDINAL STRITCH COLLEGE

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1971
This Research Paper has been
approved for the Graduate Committee
of the Cardinal Stritch College by

Sister Marie Colette, OSF
Advisor
Date August 27, 1976
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CHAPTER I

THE PROBLEM

Introduction

There is nothing mysterious about readiness. It is the product of experience and maturation . . . waiting for a child to be ready bears little fruit and is frustrating to teacher and parents and discouraging for the child. An active program of guidance to build the elements of readiness that are lacking, makes success in reading possible for all children who have the mental capacity to learn to read.¹

The concept of reading readiness is now almost a half century old in American schools. The term, reading readiness, came into existence after research investigators found that from 20 to 40 per cent of first-grade children were failing in reading.²

The view of readiness which recognizes the value of experience is expressed by Dechant when he says: "... Broadness of experience results in superior readiness for reading by equipping the child with the tools for meaningful reaction to the printed page."³

Another authority, Russell, concurs that "General maturation is important, but the teacher must also do something; she must provide


experiences which contribute to the growth of reading readiness. It seems probable that experience and a combination of physical, mental, emotional, social and psychological factors contribute to readiness in general.

There is much discussion on the value of tests, but they provide means of diagnosis and/or predictions when interpreted by sensitive teachers as part of whole programs. Reading readiness tests are evaluative devices that help teachers. Readiness tests for beginning reading are usually administered at the end of kindergarten or at the beginning of first grade.

Froebel, a German educator of the nineteenth century, opened the first "garden of children", kindergarten, in 1837. Less than twenty years later the first German kindergarten was opened in Watertown, Wisconsin by Mrs. Carl Schurz. Since the acceptance of kindergarten into the formal educational pattern, children have been provided with a setting away from home in order to have a variety of direct experiences and to learn to be accepted as individuals by their peers.

Statement of the Problem

Purpose

Curiosity, interest in early childhood education, and the enormous amount of recent publicity on early education led to the


research design of the present study. Not only educators and psychologists but also authors, lecturers, television programs, periodicals, and the news media constantly remind us that much can be done to develop the nation's children by giving them a good start at an early age. A joint statement by the National Education Association and the American Association of School Administrators includes this quotation: "One of the main contributions which early education can make to a child's intellectual development is the enlargement of his span of experience."¹

Research studies have shown that children who have had kindergarten experience are more ready for first grade reading in most instances than those who have not had the privilege of pre-schooling.² Using this idea as a base the writer wondered if the experience of additional pre-schooling would have an effect on the results of a reading readiness test, recognizing that readiness cannot be evaluated only through this medium.

Specific objectives

For the purpose of this study, the results obtained in administering the Clymer-Barrett Prereading Battery³ to two groups of five-year old kindergarten pupils were compared. One group had a previous


²Nila Banton Smith, American Reading Instruction (Newark, Delaware: International Reading Association, 1965), p. 356.

year of kindergarten as four-year olds, and the other group had not had
this experience. The following questions were projected about differences
which might appear between the groups:

1. How does the two-year kindergarten group compare with the
   one-year group in total score, visual discrimination,
   auditory discrimination and visual-motor coordination?

2. How do the boys in the two-year group compare with the boys
   in the one-year group in the three subtests and total score?

3. How do the girls in the two-year group compare with the girls
   in the one-year group in the three subtests and total score?

4. Does nursery school have an effect on the scores of those
   pupils in their first year of kindergarten?

Definition of Terms

Reading Readiness

"... can be defined as that capacity for learning to read
which results from nature and nurture interacting on each other."¹

"Reading readiness is a state of being which enables a child
to learn to read without needless frustration or anxiety."²

Readiness Test

A type of test which measures the extent to which an individual
has achieved a degree of maturity or acquired certain skills or informa-
tion needed for undertaking successfully some new learning activity.

¹Dolores Durkin, "Informal Techniques for the Assessment of Pre-
reading Behavior," in Perspectives in Reading No. 8, The Evaluation of
Children's Reading Achievement, edited by Thomas Barrett (Newark,

²Theodore Clymer and Thomas C. Barrett, Clymer-Barrett Prereading
Battery, Directions Manual, Form A (Princeton, N. J.: Personnel Press,
Visual Discrimination

The mental process of noticing likenesses and differences.

Auditory Discrimination

Hearing likenesses and differences in sound.

Visual-Motor Coordination

The ability to perceive accurately and reproduce this correctly.

Scope and Limitations

The study involved 126 children from 32 five-year old kindergartens. Sixty-three youngsters had had two years of kindergarten experience and an equal number had had only one year of kindergarten. It should be noted that of those in the one-year kindergarten group, twenty children had attended nursery school. The groups were matched by sex, each consisting of 33 boys and 30 girls. Each child in the one-year kindergarten group was also matched in age—within three months—with a child in the two-year group. The children were pupils from eleven elementary schools of one school district in a Milwaukee suburb. The Clymer-Barrett Prereading Battery of tests was administered in two sessions at each school between April 13th and May 5th. Administration and correction of tests was done by the writer.

The study was limited to one school district due to the lack of public school kindergartens at the four-year old level. It was limited to a comparison of two groups using only one test, not considering other important aspects of readiness. No information was gathered on the two-year group about any school experiences they might have had before entering
four-year kindergarten.

Significance

The literature indicates that teacher observations are very important in evaluating a child's progress in school. Readiness tests, which indicate differences in visual discrimination, auditory discrimination and/or visual-motor coordination, could be a valuable supplement to the teacher's knowledge and experience.
CHAPTER II

SURVEY OF LITERATURE

Concept of General Readiness

Webster defines readiness as the "state or fact of being ready or prepared." It is this general readiness which must be considered for children at all ages, in all areas, and at all grade levels if they are to be successful as individuals, pupils, and later as citizens. Readiness skills must be considered for the bright as well as the slow child. If children are to be taught "up to their capacity", we must recognize each one's individual uniqueness and provide an effective readiness program.1

The term "readiness" is sometimes equated with "reading readiness" without making any distinction. Hildreth states that "... overemphasis on reading readiness ignores the values of a general readiness program for every phase of subsequent learning and adjustment at school."2 Much emphasis is placed on reading readiness because the skills used in learning to read are also those required for other learnings.3


3Ibid., p. 271.
Many educators today feel that the initial step in providing a successful educational program is the estimation of a child's readiness for learning. "Yet," Wingert states, "assessment of readiness is only the first step which must be taken; the use that one makes of this assessment is by far the more important step."\(^1\)

The concept of readiness is a simple one according to MacGinitie:

"The child is in school to learn—what and how is he ready to learn?"\(^2\)

His readiness depends on the materials which will be used for instruction, the methods which will be employed and the beginning level of instruction, not to exclude his maturity, intelligence and experiences.

He continues:

\[\ldots\] One is tempted to say that nearly every six-year old is ready to learn something about reading if this something is carefully selected in keeping with his abilities and if he is guided by a compassionate teacher. The teacher, knowing the eventual goals of education, should ask what and how this child is ready to learn. And the teacher should be aware of the fact that when a child is taught a little, he is then ready for a little more.\(^3\)

Bruner succinctly states a similar idea: "\ldots that any subject can be taught effectively in some intellectually honest form to any child at any stage of development."\(^4\)

In this same vein Heffernan indicates that not only do we recog-


\(^3\)Ibid., p. 399.

nize the signs of learning readiness, but we also know that: learning is sequential, learning is built on previous knowledge, individual differences among children result in varied learning rates, learning is an active process and a child must have a good self-concept to learn effectively.1

The goal in readiness training is not to bring everyone up to the same level, but to allow each child to proceed at his best level.2 Hildreth believes:

Children tend to string out in learning and development as soon as school begins. . . . Even with the best teaching—in fact, as a result of good teaching—pupils will vary in the ways and in the rate at which they learn, for no two children's growth patterns will be identical.3

Concept of Reading Readiness

A questionnaire survey was conducted by Peery to find out how public school systems around North Texas State University determine reading readiness. The answers showed that there was no one policy among the schools. But she did find that none of the schools taught reading to six-year olds just because they had passed their sixth birthday. A few of the replies included:

- . . . writing new policies in relation to a new reading series.
- . . . turned to readiness tests for help. . . . combination of readiness test results and teacher's appraisal of the physical, social, emotional, and intellectual factors which influence


2Hildreth, Readiness for School Beginners, p. 92.

readiness for beginning reading.1

Reading readiness is widely defined as: "That time when a child can profit from group instruction in certain elements of a reading program."2 Tinker and McCullough elaborate on this definition and say "... he is ready to read when maturation, experience plus verbal facility and adjustment are sufficient to insure that he can learn in the classroom situation."3

Three main methods by which a teacher evaluates reading readiness are listed by Russell: (1) the reading-readiness test, (2) the use of an intelligence test, (3) observation of pupil behavior. He rates as most important the recorded observations of a perceptive teacher at the beginning stages of reading.4

The importance of evaluating each child's progress at all stages in his development must not be minimized. It is this progress which leads to the next stage of readiness and then on to each succeeding stage.

Sartain makes a distinction between educational readiness and maturational readiness. He believes:

Educational readiness consists of all those work habits, perceptual skills, and language skills that must be learned

---


2Roma Gans, "They Must Talk Before They Read," Grade Teacher, LXXXIV (December, 1966), p. 100.


through educative experience; no amount of waiting will produce them unless the appropriate educational program is provided.¹

To be ready for this educational program, then, the child needs to have had many experiences which have helped him develop concepts for which he has a correct and adequate vocabulary and facility with oral language. It is this background of experience and oral fluency which help him derive meaning from his reading. The necessity of bringing thought and understanding to the printed page is well phrased by Tinker and McCullough, "In a sense one reads with his own experiences."²

Hildreth generalizes that broad experience is helpful in learning to read "... because of the greater likelihood of ... meeting familiar scenes and characters in the reading context."³

Olson and Hughes stress "pacing" and "seeking", indicating that growth and maturation lead the child to accept or reject various experiences. This may result in delay or acceleration.⁴

When Gates asked in 1937, "How and what is the pupil to begin to read?" and when MacGinitie asked in 1969, "What and how is he ready to learn?", they each believed that the material and the methods made the difference.⁵ Judging the reading readiness of each child against


²Tinker and McCullough, Teaching Elementary Reading, p. 67.

³Hildreth, Readiness for School Beginners, p. 257.


this background is the teacher's task.

Factors Affecting Readiness

The literature seems to agree that factors affecting readiness are numerous and complex, are clusters or composites, and are interwoven and interrelated. And although these factors can be studied separately, they function together.¹,²,³,⁴

Broad, general factors

Russell sums up the views of many writers when he says that reading readiness depends on:

1. (1) physical factors such as the child's ability to see words clearly, (2) mental factors such as the ability to follow an easy sequence of events in a story, (3) social-emotional factors such as the ability to work with the group, and (4) psychological factors such as interest in reading.⁵

He further states that experiences are important contributors to reading readiness.⁶

The child's preparation for reading has begun long before he enters school. Looking at pictures, listening to stories, memorizing nursery rhymes, being interested in books and letters are some of the

¹Mary C. Austin, "Teaching Reading to the Kindergarten Child," in New Dimensions in Reading, ed. by Donald L. Cleland, A Report of the Nineteenth Annual Conference and Course on Reading, University of Pittsburgh (Pittsburgh: University of Pittsburgh Press, 1963), p. 36.


³Peery, "Policies Determining Which Young Children Are Ready," p. 266.

⁴Tinker and McCullough, Teaching Elementary Reading, p. 71.

⁵Russell, Children Learn to Read, p. 120.

⁶Ibid., p. 121.
activities which contribute to this preparation.1

Experiments and research have shown that children can and do learn things at an earlier age than had been thought possible a few years ago. In fact, Smith says,

Some educators are convinced that the I.Q. can be raised if the child is stimulated early and skillfully under conditions that do not upset the child's equilibrium, or in any way make him feel pressed or pushed.2

Robinson and Robinson feel it is difficult to understand how early education could be hazardous to a child if the experiences are enjoyable. Emotional development and intellectual development may be carried on simultaneously.3

Witty elaborates on the idea of more fully developing a child's intellectual potential by quoting, among others, Pine who says, "The child's intelligence grows as much during his first four years of life as it will during the next thirteen . . ."4 and Hunt in Intelligence and Experience:

... it is not unreasonable to entertain the hypothesis that, with a sound scientific educational psychology of early experience, it might become feasible to raise the average level of intelligence by a substantial degree ... this "substantial degree"

1Francis Ilg, "The Child from Three to Eight, With Implications for Reading," in New Dimensions in Reading, ed. by Donald L. Cleland, A Report of the Nineteenth Annual Conference and Course on Reading, University of Pittsburgh (Pittsburgh: University of Pittsburgh Press, 1963), p. 16.


might be of the order of 30 points of I.Q.\textsuperscript{1}

The factor of pre-school experiences

Each year children have been coming to school with more experiences gained through television. They learn to read words, see numbers, and have a mini-course in geography through some of the programs.\textsuperscript{2}

Then there are those fortunate children who come from homes where they are encouraged to express themselves freely, and have opportunities to function within various social situations. These experiences help develop the child's personality and oral skills. As stated by Tinker and McCullough: "One learns to talk by talking."\textsuperscript{3}

Other valuable experience can be gained from neighborhood play with other children and on playgrounds, and by attending nursery school or Sunday School. The amount of gain in readiness depends a great deal on the individual child and his intelligence. The above authors say: "Other things being equal, the brighter child will naturally profit more from experiences and parental guidance than the less able child."\textsuperscript{4}

The influence of the home as it relates to reading readiness is very important. Betts cites such factors as the experiences which center around travel and family discussions and also the emotional and social adjustment gained through family living. He goes on to say: "From research and experience, there appears to be substantial evidence of the

\textsuperscript{1}Ibid., p. 6.


\textsuperscript{3}Tinker and McCullough, Teaching Elementary Reading, p. 68.

\textsuperscript{4}Ibid., pp. 96-97.
positive relationship between home background and readiness for reading.\textsuperscript{1} 

The subject of teaching young children to read is too broad to be included in this paper, but a few references pertinent to home influence and experiences as they relate to early reading seem justified here.

The typical characteristics of the children Durkin writes about in the six-year California study and the three-year study in New York were an early interest in letters and "being-read-to" at an early age, by parents and/or siblings.\textsuperscript{2}

Some unexpected findings in the first study, conducted in Oakland, California, have been that more than half of the subjects came from what had been designated as the "blue-collar" class, and the intelligence scores, as measured by the Revised Stanford-Binet Scale, ranged from 91-161.\textsuperscript{3}

**Age: chronological and mental**

From the abundance of discussions and articles on the most desirable age at which to begin reading instruction, one fact emerges clearly—there is considerable disagreement among the experts.\textsuperscript{4}

In 1898 John Dewey expressed his ideas about age and beginning reading instruction. In a number of selected paragraphs from Dewey's "The Primary-Education Fetish", Betts includes the following:

\textsuperscript{1}Betts, Foundations in Reading Instruction, p. 127.

\textsuperscript{2}Dolores Durkin, "Teaching Reading to Young Children," Education, LXXXVII (September, 1966), p. 40.

\textsuperscript{3}Dolores Durkin, "Children Who Read Before Grade 1: A Second Study," Elementary School Journal, LXIV (December, 1963), pp. 143-44.

\textsuperscript{4}Morris Pincus and Frances Morgenstern, "Should Children be Taught to Read Earlier?" Reading Teacher, XVIII (October, 1964), p. 41.
While there are undoubted exceptions, present physiological knowledge points to the age of about eight years as early enough for anything more than an incidental attention to visual and written language-form.¹

A modern day advocate for a later start in learning to read is Glass. He feels the child's early school years should be devoted to listening and talking, with reading being delayed until second or third grade. His rationale is that a child can see a film or a filmstrip, or listen to the teacher and gain more information than by reading. He continues by saying: "... Word analysis ability needs about three or four years to catch up with what a youngster can understand."²

Some writers place the minimum mental age for success in first grade reading at various levels—six years, six years-four months, or six years-six months—while others have shown that children with mental ages under six years can be taught to read. Tinker and McCullough feel there is no justification for setting an exact age requirement for learning to read. But they concur with Harris that the most opportune time to teach reading is after the child is six years or older mentally because progress would be more rapid, the child requires less individual help, and it takes less effort. An individual's intelligence does not insure success in reading, but there is a relationship between mental maturity and the ability to read.³ Dechant says that in general "the

¹Betts, Foundations of Reading Instruction, p. 107.
³Tinker and McCullough, Teaching Elementary Reading, pp. 55-56.
lower the intelligence, the greater the need for a readiness program. ¹

A recommendation made by Morphett and Washburne has had a strong influence on the age at which reading is begun in the schools. They suggested a mental age of six and one-half years for beginning reading instruction.²

Durrell feels that the mental age of six can be a useful guide, but says: "Rate of learning to read seems to depend more upon auditory and visual perception of word elements and other developmental factors than upon scores on intelligence tests."³

Hampleman conducted a longitudinal study involving fifty-eight children at Bloomington, Indiana to find an answer to the question "Are pupils who start school at the age of six years-four months or over better readers in the sixth grade than those who start school below the age of six years-four months?" The median reading score for the older group was seven months higher. His conclusion was that starting school later was not a handicap and may in fact be a help to slightly better reading progress. The differences in reading achievement were not statistically significant. He thought perhaps the study had too few pupils from which to generalize.⁴


Data which Gates gathered concerning the relation between mental age and success in beginning reading led him to conclude:

In the first place, they \textit{representative data} indicate clearly that statements concerning the necessary mental age at which a pupil can be instructed to learn to read are essentially meaningless. The age for learning to read under one program or with the method employed by one teacher may be entirely different from that required under other circumstances.\textsuperscript{1}

He goes on to say that although collected data indicate the possibility of teaching young children (mental age of 5-0 or higher) to read, they do not imply that this is desirable.\textsuperscript{2}

Bond and Wagner agree with Gates. They say: "In considering mental maturity for beginning reading-instruction, the problem rightly is one of adapting material and methods to suit the individual differences in mental ability rather than waiting for each child to reach a given mental age."\textsuperscript{3}

\textbf{Visual discrimination}

Visual perception skills must be taught; they are not learned automatically.\textsuperscript{4} As other learned functions, vision needs to be subjected to stimuli for full development. Efron states that if a child’s visual skills are not \ldots made efficient at an early age, they may play an

\begin{itemize}
  \item \textsuperscript{1} Gates, "The Necessary Mental Age for Beginning Reading," p. 506.
  \item \textsuperscript{2} Ibid., p. 508.
  \item \textsuperscript{3} Guy Bond and Eva Bond Wagner, Teaching the Child to Read (3rd ed.; New York: MacMillan Co., 1960), p. 121.
\end{itemize}
important part in producing a lack of readiness to read.¹

Simpson quotes from Hobb's Organization of Human Development on
the early learning stages of basic forms perception:

... the eyes must first be able to move in the pattern
prescribed by the form. Even more specifically, before
one perceives a horizontal line, one's eyes have had to
learn to move in a horizontal line; before one is able to
perceive a vertical line, one's eyes (not just one's head
carrying one's eyes) must have learned to move in a vertical
line; before one perceives an oblique line, one's eyes must
have become able to move in an oblique line, and in order to
perceive a circular line, one's eyes must have achieved the
ability to move circularly.²

She then relates this ability of perceiving lines to perception
of form in letters.

Not only circles and squares, but all printed symbols—
indeed all forms consist of combinations or adaptations
of these basic lines. An A, for example, consists of
two oblique lines, and one horizontal one; an L consists
of a vertical line and a horizontal one; an O consists of
a circular line; and R consists of vertical lines and
segments of circular ones; a 5 is made up of a horizontal
line, a vertical line, and a partial circle. Could it be
possible that eyes that had not learned to move properly
were not able to perceive form—were not able to discover
likenesses and differences in form and to provide the
child with readiness for copying with printed symbols, in
short, with readiness for reading?³

Those children who show immaturity in copying designs and recognizing forms may have difficulty in distinguishing letter forms and words.⁴


³Ibid., p. 25.

⁴Hildreth, Readiness for School Beginners, p. 254.
Physical maturation and experience are important for development of vision. If a child has had toys and games which he could manipulate, and has had many occasions to observe objects near and far, his chances of possessing good visual discrimination abilities are likely superior to those of a child who has not had various experiences with manipulative devices.¹

Visual acuity and visual discrimination are not synonymous. A child may possess sharpness of vision, but may not have learned to observe the number of small differences in words or have learned, according to Tinker and McCullough, "... that these differences may occur in different positions within the words."²

The kinds of materials used to teach visual discrimination should be related to what is done in the reading process to be effective; that is, practice visual discrimination on letters and words for effective transfer of learning.³ The same idea is stated by Dechant: "The matching of non-word forms and pictures seems to have little benefit on letter or word perception. The learning in the former does not seem to transfer to performance on the latter."⁴

In MacGinitie's summary of past readiness research findings, he

¹Marion Monroe, Growing Into Reading (Chicago: Scott, Foresman and Company, 1951), pp. 146-47.

²Tinker and McCullough, Teaching Elementary Reading, p. 64.


⁴Dechant, Improving the Teaching of Reading, pp. 153-54.
says: "... later reading comprehension seems to be predicted better by visual discrimination of letters and words than by visual discrimination of geometric forms."¹

Many studies have been carried on to find the factors of reading readiness which are good predictors of successful achievement in reading at the primary level. One such study was conducted to determine if a combination of six readiness factors could be used to predict probable success in reading. The factors considered were mental age, auditory discrimination, visual discrimination, letter identification, social class status and maternal need-achievement. From a group of 475 kindergarteners tested the previous May, a group of 87 first graders was randomly selected to participate. The conclusion from this study was that the ability to identify letters had the greatest predictive value. But this does not mean that a child who learns his letters will succeed in first grade reading. This ability, no doubt, reflects some experiences the child had prior to first grade.²

A study of visual discrimination tasks and their predictive value for reading was made by Barrett. He examined papers on: knowledge of letters, words, shape matching, geometric figures and pictures.³ Barrett then initiated a study which sought to show how nine reading


readiness factors contributed to prediction of first-grade reading success.\textsuperscript{1} He found that reading letters and numbers ranked highest as a predictor of first-grade reading; but stated, as have others, this does not mean the child will be a good reader if he learns his letters and numbers. Other factors probably made him interested in learning this. He states:

\ldots the findings appear to support the conclusion that an optimum combination of visual discrimination tasks for predicting first grade reading achievement would include tasks similar to Reading Letters and Numbers, Word Matching, and Pattern Copying.

Barrett goes on to say that visual discrimination cannot be used alone as a readiness factor for reading. It must be used in conjunction with "\ldots auditory discrimination, language facility, story sense, and understanding what reading is."\textsuperscript{2}

Goins' work on visual perception is often referred to in the literature. She administered fourteen visual perception tests of a non-verbal nature to 120 first grade pupils.\textsuperscript{3} The test which correlated most highly with the reading test (.519) was pattern copying. In this test the subject looks at a completed model and then draws the missing lines in a second model with figures becoming progressively more complicated. There are thirty-six patterns in all.\textsuperscript{4}

Two factors of visual perception ability were identified in this study—the ability to "keep in mind a configuration against distraction (strength of closure)" and the "ability to perceive and keep in mind a

\begin{itemize}
  \item \textsuperscript{1}\textit{Ibid.}, p. 277.
  \item \textsuperscript{2}\textit{Ibid.}, p. 281.
  \item \textsuperscript{4}\textit{Ibid.}, p. 105.
\end{itemize}
perceptual whole." Goins indicated that the findings suggest a need for revision in reading readiness tests since tests measuring closure are good predictors of reading success.¹ She interpreted her results to conclude:

... a theory of the nature of visual perception in reading is postulated thus: Efficient reading involves ability not only to hold in mind the "wholeness" of a word, phrase, or sentence ... but also to attend to individual words, and, at times, to parts of words. Perceiving in a general way the whole but not discriminating clearly among its component elements (letters, words, phrases) may cause as much difficulty in reading as does concentrated attention on word-analysis and word-calling. The good reader either develops or possesses inherently strength of closure, thus performing both acts in harmony or simultaneously.²

Auditory discrimination

Two background abilities, learned either at home or in school, necessary before being able to read are visual and auditory discrimination of word elements. Again, the distinction must be made between acuity and discrimination. A child's hearing may be unimpaired, but he still might not have the ability to discriminate sounds in letters and words due to lack of training and experience. It is necessary to train the ear to hear sounds in various parts of words—beginning, middle, and end.³ The same sound can be heard in any part of a word and the child must learn that "differences between words may occur anywhere within the word." If the child's hearing is normal, a deficiency in auditory discrimination can usually be eliminated.⁴ This skill can be taught.

The child who will learn to read with ease will be able to

¹Ibid., p. 102. ²Ibid., p. 104.
³Durrell, Improving Reading Instruction, p. 42.
⁴Tinker and McCullough, Teaching Elementary Reading, p. 61.
tell you before leaving kindergarten that cake, cookies and corn all sound alike at the beginning. Having a high I.Q. or extensive phonic lessons does not insure success per se.\textsuperscript{1} Even the brightest child cannot succeed if he lacks auditory discrimination ability.

Sex differences in reading achievement usually favor girls. Durrell quotes Murphy's study which indicates that "sex differences in reading achievement ... were not significant when boys were given help in auditory and visual discrimination."\textsuperscript{2}

La Pray and Ross believe that it is almost impossible to separate visual from auditory discrimination. Some children who have problems in learning to read cannot discriminate isolated sounds and attach meaning to them. Using a test they have constructed and with which they have recently experimented, the authors have found that the results do not correlate highly with an intelligence test. This pleases them because "... it suggests that auditory perception and intelligence are two different facets of the central processing system."\textsuperscript{3}

The letter-to-sound relationship is primarily a memory task, but teachers cannot leave this learning to chance. It must be cultivated and reinforced at all early levels of schooling with appropriate readiness

\textsuperscript{1}Donald D. Durrell and Helen A. Murphy, "The Auditory Discrimination Factor in Reading Readiness and Reading Disability," \textit{Education}, LXXIII (May, 1953), p. 556.

\textsuperscript{2}Ibid., p. 559.

activities.¹

Visual-motor coordination

Two composite factors have been indicated recently as good predictors of reading success—auditory-visual integration and visual-motor coordination.²

In checking readiness booklets for clues to unsuccessful readers, Simpson found that poor performance on a ten-item copying test was an indicator. Some children had good total scores, but were not successful in learning to read.³

Two researchers quote the Goins¹ study:

Goins (1958) found that pattern copying had the highest correlation with subsequent reading success in her investigation, and she concluded that the task should be included in readiness tests.⁴

Goins found Pattern Copying had a higher correlation with reading than all fourteen other tests combined, .519 to .497.⁵

Betts cites Di Meo on visual motor skills:

First, different modalities of learning . . . are related and, in turn, contribute to performance on a visual-motor test. Second, both the visual and motor facets of a complex of


³Simpson, Learning to Learn, p. 16.


visual-motor skills contribute to word discrimination. The relationship between copying geometric forms and copying letters and words is that letters are geometric forms. In a study by Bosworth an experimental group received individual special instruction, within the regular kindergarten program, based on their achievement in the visual-motor skills test. Betts quotes Bosworth "that visual-motor skills can be developed. . . . and this type of instruction increases the range of achievement among five-year olds. . . ." Bosworth also concluded that training in the visual-motor skills is helpful in word discrimination.

Subtests of the Metropolitan Readiness Test which correlated most highly with reading achievement included those testing visual-motor and visual discrimination skills.

Kindergarten Experience and Pre-reading Skills

Not every child entering an American public school has the opportunity of enrolling in kindergarten. And an even less likely possibility is the opportunity to attend a two-year kindergarten program. With so much speculation, knowledge, and study about early education and pre-school experiences, the statements by Robinson and Robinson seem pertinent:

The only really safe conclusion one can make of the available data is that there is a vast amount we need to know about the role of experience in early childhood, and that the only effec-

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2 Ibid., p. 293.
3 Ibid., p. 293-94.
ive way to go about investigating it is through longitudinal studies of rather large proportions. In view of the current pressure to engage in active intervention during the pre-school years, the urgency of initiating this long-term research must not be ignored.

One innovation which has been proposed is the full day of school at the kindergarten level. Gorton and Robinson advocate formal academic activities in language, science, mathematics, social studies, and music. They claim that there could be more flexibility in the classroom and longer blocks of time devoted to learning. If more time might be needed to completely develop a concept, the instruction could be delayed and reinforced later. On the other hand, if the group was highly motivated, there would be greater freedom to continue an idea. The full-day kindergarten would require the help of a teacher's aide. A pilot study of a full-day kindergarten was begun in 1967 in Arlington, Vermont. As yet there is no published research on the advantages of this type of program.

Other countries, too, are becoming more aware of the importance of early childhood education. The Japanese government plans a kindergarten experience for every child or attendance at a day nursery before entering primary school. The public and private kindergartens have increased from 2,455 in 1951 to 8,551 in 1965. A problem they are facing is parental pressure to teach reading, writing and arithmetic at an early age. The Institute in Hiroshima University has planned to conduct research on the teaching of the 3 R's in the kindergarten, methods to be

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used, and other factors.  

Hillerich makes the statement that "reading readiness is becoming less nebulous as we identify certain pre-reading skills which lead to success in reading."  

A list of reading readiness skills, presented nineteen years ago at the Conference on Reading at the University of Pittsburgh, is still relevant today. Sullivan listed them as:

Visual Discrimination
Auditory Discrimination
Visual Memory
Development of Comprehension
Kinesthetic Abilities  

A more complete and current rating scale for pre-reading skills has been taken from the Ginn manual and follows:

Facility in Oral Language
Concept and Vocabulary Development
Listening Abilities
Skills in Critical and Creative Thinking
Visual Discrimination
Auditory Perception
Social Skills
Emotional Development
Attitude toward and Interest in Reading
Work Habits
Muscular Coordination
Visual Acuity

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Two phases of the reading program are presently receiving much scrutiny. One questions the most effective kind of prereading instruction, and the other questions the most opportune time for beginning formal reading instruction.

Activity-experience approach or use of readiness workbooks?

A study designed to investigate the question, "Does a kindergarten child show more readiness and potential for reading after he has been through readiness books of a basal reader program or after he has had an activity program of experiences?" led to the following conclusions: The experience-activity approach is better for boys; readiness in girls develops equally well in both approaches. The investigation was limited to a single school in one locality, with two groups, taught by the same teacher, consisting of twenty-eight children in each, matched by sex and age.2

In another study, all kindergarten activities were the same for the two groups of children, taught by the same teacher, with one exception—one group used readiness workbooks for the last nine weeks of the kindergarten year. No significant differences were found between the two groups when tested with the Metropolitan Readiness Test at the


beginning of school the following September.¹

Hildreth's summary favors the informal, activity-experience type kindergarten program.

In some schools reading readiness is interpreted as formal drill with exercises in reading readiness booklets. In other schools reading readiness is identified with the activity program, featuring incidental learning through congenial experiences in play life at school. There is support for this broader interpretation of reading readiness in the statistical evidence that learning to read depends upon general intellectual development and linguistic maturation, as well as upon specific readiness in terms of visual, auditory and motor capacities.²

Another supporter of the informal kindergarten approach to development is Moskowitz. She believes some parents are pressuring for early reading thinking this is a status symbol.³

In Dykstra's review of reading readiness test research, he states:

... there is no clear-cut evidence that the use of readiness workbooks and readiness materials improve a child's readiness for reading beyond what could be expected from an informal kindergarten program.⁴

Early instruction

The need to learn exists for everyone. Spodek and Robinson believe that: "The mechanics of reading may or may not be important for some five-


²Hildreth, Readiness for School Beginners, p. 263.

³Sue Moskowitz, "Should We Teach Reading in the Kindergarten?", Elementary English, XLII (November, 1965), p. 798.

year olds, but the development of basic concepts and verbal and symbolic skills are a necessity for all children.¹

Some educators are questioning if there is a place for reading in the kindergarten. Durkin responds, "Good education at any age level is an adaptive response to the children being educated. As the children change, so too must their education."²

In Durkin's article on "A Fifth-Year Report on the Achievement of Early Readers" she points out that the data . . . indicate that early achievement in reading has no detrimental effect on subsequent achievement. In fact, some of the data suggest that an earlier start in reading leads to greater achievement in future years.

But she goes on to say that these findings do not infer that a typical first grade reading program should be moved into the kindergarten. The early readers were children who learned to read at home because of individual desires to learn and having someone at home interested in furthering this curiosity to learn.³

Another much-publicized reading experiment is the Denver Study. It is a six-year study, kindergarten-5th grade, of a large randomly grouped population. Teachers could withhold anyone from the program thought to be too immature; no readiness testing was used. At the kindergarten level the only difference between the control and experimental groups was the reading instruction for twenty minutes per day using the


²Durkin, "Teaching Reading to Young Children," p. 41.

seven types of learning activities developed by McKee and Harrison. The results show that to maintain the gains made by the experimental group beyond the second grade, the children needed an adjusted teaching program in all grades following the kindergarten year.¹

A general statement was made by these researchers that most average youngsters in a large city public school system can learn to read in kindergarten.² They further stated: "No evidence was found that early instruction in beginning reading affected visual acuity, created problems of social adjustment or caused dislike for reading."³

Readiness Tests

Tests are not infallible measures, but they may be considered fairly reliable guides when the correct test is chosen for a specific task. The methods which Russell considered important in evaluating a child's readiness during early schooling are restated by Hildreth: "A combination of test results and teacher ratings, observations, and informal tests furnishes a more reliable basis for determining readiness than the test alone."⁴

A reading readiness test is usually most reliable in prediction for the two extremes in the school population, the most and least promising pupils, and not likely as reliable for the average.⁵

²Ibid., p. 25.
³Ibid., p. 24.
⁴Hildreth, Readiness for School Beginners, p. 83.
⁵Ibid., p. 259.
There is no test which claims to measure all of the reading readiness factors, and no one test is completely reliable. But much information can be gotten from the test by analysis of its parts and by observing the child's attention span and ability to follow directions while the test is being administered.

Tinker and McCullough indicate that: "... diagnosis by means of part scores on reading-readiness tests is a valuable aid to instruction at various stages in the first two grades and for use with reading disability cases where performance is below second-grade reading."\(^2\)

An important finding in a study reported by Roche, in the Van Dyke Schools in Michigan, showed that a child might have an average total score on a reading readiness test, but score low in "functional visual and/or functional auditory acuity."\(^3\)

Many teachers place a great deal of confidence in the reading readiness test, and this confidence is well-founded. But a test of this kind should not be used to measure the full extent of readiness which the child has obtained. Varying results exist in the literature.

In analyzing the data received from a reading readiness test and a reading achievement test from 111 first grade children who had been tested in September and then again in May, Karlin found that "a very small relationship between the scores obtained on the reading readiness

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1Ibid., p. 263.

2Tinker and McCullough, Teaching Elementary Reading, p. 76.

tests and the reading achievement test exists.\footnote{1}

The purpose of Bagford's study was to "measure the relationships between scores on readiness tests given early in \footnote{2} child's educational career and later measures of his reading success." The data seem to warrant these conclusions:

Reading readiness test scores are significantly related to later success in reading. Students who score well on reading readiness tests in kindergarten and first grade tend to score well on reading achievement tests in grades four, five and six. . . . the relationships between readiness test scores and measures of early success in reading do not decrease significantly as children progress through school.\footnote{2}

A study of the validity of the Clymer-Barrett Prereading Battery led Johnson to conclude, "The Clymer-Barrett Prereading Battery more accurately predicted reading success as measured by the Gates-MacGinitie Reading Tests than did the Metropolitan Readiness Tests."\footnote{3} It was also found that two of the subtests—Recognition of Letters and Discrimination of Beginning Sounds—were probably as good predictors of reading success as the entire battery.\footnote{4}

Barrett analyzed the content of five readiness tests and found that the items in them varied. The only general factor included in all the tests was visual discrimination. The tests he compared were: \underline{Gates Reading Readiness Tests}, The Harrison-Stroud Reading Readiness Profiles,

\begin{flushright}
\footnote{2} Jack Bagford, "Reading Readiness Scores and Success in Reading," \textit{Reading Teacher}, XII (January, 1963), p. 328.
\footnote{3} Johnson, "The Validity of the Clymer-Barrett Prereading Battery," p. 613.
\footnote{4} \textit{Ibid.}, p. 613.
\end{flushright}
Lee-Clark Reading Readiness Tests, Metropolitan Readiness Tests and Murphy-Durrell Diagnostic Reading Readiness Tests.¹

He cites recent studies dealing with reading achievement prediction and states that three factors seem to be important: visual discrimination and letter knowledge, auditory discrimination of beginning sounds, and the ability to hold a figure in mind against distraction. He does not advocate that all readiness tests be the same, but says: "... enough information is available in this general area of study to provide worthwhile suggestions about some specific factors that might prove valuable both predictively and diagnostically, as a core for almost all readiness tests."²

Summary

Readiness is general preparation for learning—for all disciplines and for all age levels. Readiness and reading readiness are often equated because the skills necessary for learning to read are also those necessary for learning in general. A child is considered to possess reading readiness when he can profit from classroom instruction. Readiness develops and grows through maturation and experience.

Readiness is a complex composite of many factors which can be described separately, but do not function in isolation. These general factors are physical, social, mental, emotional and psychological, and experiential.


²Ibid., pp. 27-28.
Experience and research show that children are learning more and at an earlier age than had been thought possible. One source of early learning is television. Wholesome experiences in the home, on the playground, at nursery and/or Sunday School also help develop the child's readiness.

The age at which to begin reading is still controversial, although there seems to be agreement that it is inadvisable to start a child who has not reached proper mental maturity. The effort is too great for the results achieved. Rather than age, the methods and materials used in learning to read, by a perceptive teacher, seem to make the difference. There is a relationship between mental maturity and ability to read, although a high I.Q. does not insure success in reading achievement.

The specific skills of visual discrimination, auditory discrimination, and visual-motor coordination have been found to be important in learning to read. Ability to identify letters and numbers and discrimination among words seem to be the best predictors of probable success in reading. But knowing letters must reflect learning experiences other than sheer drill on letters to be a good predictor.

Auditory discrimination can be taught and must be learned before a child becomes an efficient reader. Visual and auditory discrimination seem to be complimentary functions working together. Research studies have shown that visual-motor coordination is also a good predictor of reading success, and it has been indicated that training in this skill helps in word discrimination.

Much more research needs to be done at the pre-school and kindergarten levels to understand the effects of various experiences on the learnings of children. Some studies in progress involve a full-day
kindergarten, teaching academic subjects at the kindergarten level, and comparing the activity-experience approach to learning as opposed to a more formal approach.

A reading readiness test can be a helpful guide in prediction and diagnosis when used with other measures such as teacher observations, informal tests, and intelligence tests. Some investigators feel there is now considerable evidence available to show that it could be advantageous to include certain factors in all readiness tests.
CHAPTER III

EXPERIMENTAL PROCEDURE

This study was designed to compare the results obtained by two groups of children to whom the Clymer-Barrett Prereading Battery had been administered. The children were currently enrolled in the same suburban school system's five-year old kindergarten program.

The Kindergarten Program

The two-year kindergarten program provides opportunities, in a structured but informal school setting, for the children to develop totally—intellectually, socially, emotionally, psychologically and physically. As a member of the Junior Kindergarten group, the four-year old learns how to interact with his peers through free play and creative activities. Sharing experiences provides a favorable learning climate which helps to develop good habits.

The activities which begin at the four-year level are developed sequentially as the child enters Senior Kindergarten. This includes expanding concepts about health and safety, muscular development and coordination through use of playground and room equipment, sensory development through games and activities, art and music experiences, numbers, and readiness activities which involve language development, listening skills, auditory and visual discrimination, concept development and attitudes.

Two learning experiences introduced at the five-year kinder-
garten level are speech improvement and science. The speech improvement program consists of a twenty-minute presentation by the speech therapist once a week extended throughout the week by the kindergarten teacher. This work makes the children more aware of sound and voice, and helps their development of auditory discrimination. The science class is taught by the kindergarten teacher, using the Science Curriculum Improvement Study material from the University of California. The help of a special consultant in the science area is available.

Both the four and five-year old kindergarten classes meet for two and one-half hours each day, the juniors in the morning and the seniors in the afternoon. Regular attendance is encouraged. In this way the program can operate to be of greatest benefit to the children.

Selection of Subjects

The two groups were composed of: (1) children who had had two years of kindergarten in the same school system and (2) children who were in their first year of kindergarten in this system. The numbers of the study were dictated by the number of children presently enrolled in their first year of kindergarten as five-year olds. This number was sixty-three.

A listing was made of the children in the one-year kindergarten group which included the following information: name, birthdate, sex, and nursery schooling. This information was gathered by the writer from school office records and recorded on a tabulation sheet which had been prepared for this purpose. The nursery school information was requested from the parents through each school office.

The group of two-year kindergarten children was then selected from the same school records by matching sex and age, within three months.
The pairs of children (one child with two years of kindergarten and one child with one year of kindergarten) were from the same classroom, except in four cases where it was necessary to match the children by sex or age from another classroom.

The 126 children were enrolled in 32 kindergarten classrooms in 11 schools within the same school system. In gathering the data, four children were eliminated from the study (two boys and two girls) when it was found that one boy and one girl had had a year's kindergarten at different schools in the same system. (The total number was then 122.) There were 64 boys and 58 girls in the two groups, 32 boys and 29 girls in each. Their chronological ages ranged from 7 years, 1 month to 5 years, 6 months, as of the 31st of March.

Twenty of the children in the one-year kindergarten group had had some school experience prior to entering five-year kindergarten, varying in amounts from one month to three semesters—not only in different nursery schools but in various parts of the country. It was not known if any of the children with two years of kindergarten had had nursery schooling prior to entering four-year kindergarten.

Selection of Test

The Clymer-Barrett Prereading Battery was standardized on a large population (over 5,000 public school pupils), in widely distributed geographical locations including children from rural, urban and suburban areas and from different socio-economic groups.

The authors suggest that there is not enough difference between children at the end of the kindergarten year and beginning first grade
to warrant gathering material for separate kindergarten norms.

Users may be assured that pupils will be rank ordered in spring approximately as they will in fall, even though raw scores may gain slightly. . . Furthermore, when using first grade norms, teachers will be comparing kindergarten pupils with a standardization group who are at the point where beginning reading traditionally starts. 1

Reliability and validity of the battery

Statistical data indicate that the three subtests and total score can be used with a high degree of confidence. A separate table indicating reliability coefficients for special groups includes a group of kindergarten pupils tested in May.

To be valid the substance of a test should be a sample of the skills to be tested. The content of the test used in this study has validity:

because it was drawn directly from the kinds of skills it measures; because it is highly related to pupil's early readiness experiences; and because there is evidence to show that, of all the kinds of items that might have been included, those actually used represent the optimum sampling of skills and understandings. 2

Description of test parts

The test battery consists of six paper-and-pencil tasks which evaluate a pupil's readiness in visual discrimination, auditory discrimination, and visual-motor coordination. The following descriptions of the tasks were summarized from the test manual.

Visual Discrimination.

Task 1 - Recognition of Letters. - There are thirty-five
items which measure the pupil's ability to recognize letters—twenty-five lower case and ten capital letters. The pupil marks one of five choices of letters named by the teacher.

Task 2 - Matching Words.- There are twenty items in the test which involve seeing likenesses and differences in words. The child locates and marks one word out of four which matches the stimulus word.

Auditory Discrimination.

Task 3 - Discrimination of Beginning Sounds in Words.- Twenty items demand discrimination of likenesses and differences in beginning sounds of words. The choice is made from three alternatives, orally presented by the teacher and pictures in the test. The pictures are named by the teacher to avoid any ambiguity.

Task 4 - Discrimination of Ending Sounds in Words.- Twenty items demand discrimination of likenesses and differences in ending sounds of words. The task is similar to that in Task 3 except that it deals with final sounds in words instead of initial sounds. The ending sounds are usually rhyming.

Visual-motor Coordination.

Task 5 - Shape Completion.- Twenty pairs of drawings (geometric shapes) are presented—the first drawing is complete and the second incomplete and needs to be completed to match the first. The task requires perception of what is missing and drawing in those missing lines.

Task 6 - Copy-A-Sentence.- A seven word sentence is presented. The child aids to reproduce the sentence with words in correct sequence. He needs to perceive the order of letters in words, groupings of letters which make up words and sequence of words in a sentence. The sentence
needs to be reproduced on lines provided for this purpose. It is the only task which is strictly timed in the battery.¹

The battery contains a total of 122 items. Percentile rank according to total score and stanine equivalents of part scores and total score may be obtained from tables in the test manual.

The Testing Program

After the two groups had been established, it was necessary to set up a testing schedule. The time and room schedule was arranged after individual letters had been written to each principal and cleared with the Elementary Supervisor.

The Clymer-Barrett Prereading Battery was administered by the writer at each of the eleven schools between April 13th and May 5th, with a few tests given through May 8th, due to absences. Names had been written on each test booklet and sharpened primary pencils were supplied. Rooms suited to the purpose of administering the tests were made available by the principal at each school.

When the group consisted of over ten children, an aide was enlisted to help in room arrangement and to insure adequate supervision. The following statement is made on page eleven of the test manual: "Children taking the battery will have to be encouraged not to copy." Cardboard dividers were devised by the writer and quickly set up before each testing situation to insure privacy for each child.

Time requirements

The full battery required approximately ninety minutes. Test-
ing was limited by the time children were in school—two and one-half hours each afternoon.

The children were tested on two separate days. The first testing experience was with tests 1 through 4 (1 and 2 visual discrimination and 3 and 4 auditory discrimination) administered during a one-hour session. A short rest was given between the first and second tests and again between tests three and four, with a longer, more active period of relaxation between tests two and three. The booklets were collected after the first session and distributed again at the second session.

Test correction

The tests were scored by the writer shortly after administration and re-checked after an interval of more than two weeks. A key was provided with directions for scoring the test. The first four tests required matching the answer key against the test-booklets and marking the number correct. The last two tests required a degree of subjective judgment, although guides for scoring were given in the Key. Evaluations in tests five and six were made by the writer and a primary teacher.

Statistical Treatment of the Data

The sample consisted of 122 cases, 61 in each group. Matching variables were age, within three months, and sex. Each child in the one-year group was paired with one in the two-year group who met these two requirements. Any other variables existing between each pair of children occurred by chance.

The raw data were contained in the 122 test booklets of the Clymer-Barrett Processing Battery which had been completed by the kindergarten
children. From these raw data the t-test results were completed.

All of the formulas used are listed below. Because the two groups in this sample were paired, the formula for the Standard Error of the Difference Between the Means which includes the coefficient of correlation was used.

1. Mean = \( \frac{\sum x}{N} \)

2. Standard Deviation = \( \sqrt{\frac{\sum x^2}{N}} \)

3. Standard Error of the Mean = \( \frac{\sigma}{\sqrt{N-1}} \)

4. Standard Error of Difference: Between Means

\[
\sqrt{\frac{\sum x_1^2 + \sum x_2^2 - 2 \sum x_{12}}{N_1 + N_2 - 2}} \cdot \frac{\sigma_1}{\sqrt{N_1}} \cdot \frac{\sigma_2}{\sqrt{N_2}}
\]

5. Coefficient of Correlation = \( \frac{N \sum xy - \sum x \sum y}{\sqrt{N \sum x^2 - (\sum x)^2} \sqrt{N \sum y^2 - (\sum y)^2}} \)

6. t-score = \( \frac{m_1 - m_2}{\sigma_{m_1}} \)

Summary

A study was designed to compare the results obtained on a reading readiness test by two groups of children attending five-year kindergarten in a suburban school district. One group was currently enrolled in the second year of kindergarten while the other was in its first year. This first year group also included twenty children with nursery school. The two-year kindergarten program is based on an activity-experience approach to learning with sequential development from the four-year level to the five-year. The long form of the Clancy-Barrett Prereading Battery, which required approximately ninety minutes, was administered by the writer in two sessions at each school. There were one hundred twenty-two items testing visual
discrimination, auditory discrimination and visual-motor coordination. All of the tests were scored twice by the writer and the statistical treatment of the data followed.
CHAPTER IV

INTERPRETATION OF THE RESULTS

Presentation of the Data

The Clymer-Barrett Prereading Battery was administered to 122 children currently enrolled in the five-year kindergarten in 11 suburban schools of the same school district. One group was composed of 61 children who had had a previous year of kindergarten, and the other group consisted of 61 children who were in their first year. Included in the one-year group were 20 children with some nursery school experience, ten girls and ten boys.

The children who were presently enrolled in their first year provided the structure for the groups. This group of 32 boys and 29 girls had a mean chronological age of 5 years, 10 months. The second year group was formed by matching sex and age, within three months, against the one-year group. This group also had 32 boys and 29 girls with a mean chronological age of 5 years, 10 months as of March 31st. The distribution by chronological age of the pupils is shown in Table 1.

The reading readiness test used provided subtest scores in visual discrimination, auditory discrimination, and visual-motor coordination and a total score for the three subtests. The results obtained by the two groups on the long form of the test were compared.

The total scores were converted to percentile ranks using the table provided in the manual. In Table 2 the distribution of these ranks of the
total scores for the two kindergarten groups is shown, noting those with nursery school experience. Twenty-four children of the two-year group and twelve of the one-year group received scores above the seventy-fifth percentile. Of the twelve children in the one-year group, seven had also had some nursery school. Although about the same number of children in each group had scores ranking above the fiftieth percentile, seventeen of the twenty kindergarten-plus-nursery school children were included in the one-year kindergarten group. Nursery school experience tended to enhance pupils' scores. Only two two-year kindergarten children scored below the twenty-fifth percentile while six of the one-year group scored at the twenty-fifth percentile and below. It was not known if any of the two-year kindergarten group also had nursery school experience.

Table 5 shows another distribution of percentile scores which was
### TABLE 2
PERCENTILE RANKS OF TOTAL SCORES FOR TOTAL TWO-YEAR AND TOTAL ONE-YEAR KINDERGARTEN GROUPS

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N = 61 pairs
The number in parenthesis is the number of pupils who had nursery school experience.
TABLE 3

PERCENTILE RANKS OF TOTAL SCORES FOR TWO-YEAR
KINDERGARTEN GROUP PAIRED WITH ONE-YEAR
KINDERGARTEN GROUP, NO NURSERY SCHOOL

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N = 41 pairs
tabulated omitting the nursery school children and using the two-year group paired with the one-year group, consisting of forty-one pairs.

Thirteen children in the two-year kindergarten group and five in the one-year group received scores above the seventy-fifth percentile. About the same number of children in each group had scores which ranked above the fiftieth percentile. Scores at the twenty-fifth percentile and below included four children from the one-year group and one child from the two-year group.

Following is the first of four questions which had been proposed at the outset of the experiment. (1) How does the two-year kindergarten group compare with the one-year group in total score and on the three subtests? As can be seen in Table 4 the mean scores of the two-year kindergarten children were higher than those of the one-year kindergarten children. The t-scores were similar except for auditory discrimination.

### TABLE 4

**COMPARISONS OF TOTAL TWO-YEAR KINDERGARTEN GROUP WITH TOTAL ONE-YEAR KINDERGARTEN GROUP**

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<td>44.75</td>
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</table>

N = 61 pairs
The t-test indicated that the differences between the mean scores of the two-year kindergarten children and the one-year kindergarten children were not statistically significant at the 5% level.

(2) How do the boys in the two-year group compare with the boys in the one-year group in the three subtests and total score? These comparisons are shown in Table 5. The difference between the means in the visual discrimination subtest resulted in the largest t-score. The smallest difference between the two groups was in the auditory discrimination subtest. The difference between the mean scores in total score and visual-motor coordination resulted in similar t-scores. All of the differences between the means favored the two-year kindergarten boys, although none of the differences was statistically significant.

**TABLE 5**

**COMPARISON OF TWO-YEAR KINDERGARTEN BOYS WITH ONE-YEAR KINDERGARTEN BOYS**

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</tbody>
</table>

N = 32 pairs
(3) How do the girls in the two-year group compare with the girls in the one-year group in the three subtests and total scores? All of the comparisons are shown in Table 6.

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N = 29 pairs

The differences between the mean scores as evaluated by the t-test from largest to smallest were in visual-motor coordination, total score, visual discrimination and auditory discrimination. All of the differences between the means as indicated by the t-scores favored the two-year kindergarten group although none of them was statistically significant.

(4) Do the one-year Kindergarten-plus-nursery school children affect the scores? When Tables 2 and 3 were compiled, it was noted that the small group of first year kindergarten children who had had nursery school training could affect the outcome of the comparisons. Therefore, additional comparisons were made between these twenty one-year-plus-nursery school children and their partners from the two-year group. The results are shown in Table 7.
TABLE 7
COMPARISON OF ONE-YEAR KINDERGARTEN-PLUS-NURSERY SCHOOL CHILDREN WITH PAIRED TWO-YEAR KINDERGARTEN CHILDREN

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</tbody>
</table>

The differences between the mean scores were extremely low in all cases. The negative t-score in auditory discrimination indicated a difference which favored the nursery group.

Table 8, which compared the one-year kindergarten-plus-nursery boys with their two-year partners, revealed insignificant differences between them. The largest difference existed between the mean scores in visual discrimination, favoring the two-year kindergarten group. The differences between the mean scores in auditory discrimination favored the nursery group.

Interpretation of Table 9 shows the very low t-scores evaluating the differences between the means of all subtests as well as total score for the one-year-plus-nursery girls and their partners from the two-year kindergarten group. Mean scores were higher for the two-year kindergarten group except in visual discrimination.

The t-test results shown in Tables 7, 8, and 9 suggested that nursery schooler's performance approximated that of the two-year group.
### TABLE 8

**COMPARISON OF ONE-YEAR KINDERGARTEN-PLUS-NURSERY SCHOOL BOYS WITH PAIRED TWO-YEAR KINDERGARTEN BOYS**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>68.90</td>
<td>35.00</td>
<td>45.20</td>
</tr>
<tr>
<td>S.D.</td>
<td>23.79</td>
<td>25.51</td>
<td>11.03</td>
</tr>
<tr>
<td>S.E. M</td>
<td>7.93</td>
<td>8.50</td>
<td>3.67</td>
</tr>
<tr>
<td>S.D. M</td>
<td>11.92</td>
<td>5.43</td>
<td>4.01</td>
</tr>
<tr>
<td>t</td>
<td>.32</td>
<td>1.12</td>
<td>-.54</td>
</tr>
</tbody>
</table>

N = 10 pairs

### TABLE 9

**COMPARISON OF ONE-YEAR KINDERGARTEN-PLUS-NURSERY SCHOOL GIRLS WITH PAIRED TWO-YEAR KINDERGARTEN GIRLS**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>96.00</td>
<td>35.50</td>
<td>47.60</td>
</tr>
<tr>
<td>S.D.</td>
<td>16.22</td>
<td>9.38</td>
<td>7.96</td>
</tr>
<tr>
<td>S.E. M</td>
<td>5.40</td>
<td>3.12</td>
<td>2.65</td>
</tr>
<tr>
<td>S.D. M</td>
<td>6.34</td>
<td>3.49</td>
<td>2.53</td>
</tr>
<tr>
<td>t</td>
<td>.07</td>
<td>-.22</td>
<td>.39</td>
</tr>
</tbody>
</table>

N = 10 pairs
These twenty children and their two-year kindergarten partners were then subtracted from the total 61 pairs, and the remaining groups of 41 each were evaluated.

As can be seen by inspection of Table 10, all of the means of the two-year kindergarten children were higher than those of the one-year children.

**TABLE 10**

**COMPARISON OF ONE-YEAR KINDERGARTEN CHILDREN, NO NURSERY SCHOOL, WITH PAIRED TWO-YEAR KINDERGARTEN CHILDREN**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>86.73</td>
<td>79.31</td>
<td>43.95</td>
<td>41.07</td>
</tr>
<tr>
<td>S.D.</td>
<td>16.69</td>
<td>17.80</td>
<td>8.03</td>
</tr>
<tr>
<td>S.E.</td>
<td>2.63</td>
<td>2.81</td>
<td>1.27</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.76</td>
<td>1.73</td>
<td>1.91</td>
</tr>
<tr>
<td><em>t</em></td>
<td>1.98</td>
<td>1.65</td>
<td>1.09</td>
</tr>
</tbody>
</table>

*N = 41 pairs  *Significant difference at .05 level

The difference between groups in total score was barely short of being statistically significant. Differences between the means in visual and in auditory discrimination were insignificant, with the smallest amount of difference existing between the two groups in auditory discrimination.

The *t*-score of 2.24 in visual-motor coordination indicated a statistically significant difference between the mean scores of the two groups. The 5% level of confidence for the value of *t* with this number of cases in the samples was 2.02. The difference favored the two-year kindergarten group.
Table 11 shows the comparison in performance of the kindergarten boys— one year, no nursery school versus two years.

**TABLE 11**

**COMPARISON OF ONE-YEAR KINDERGARTEN BOYS, NO NURSERY SCHOOL, WITH PAIRED TWO-YEAR KINDERGARTEN BOYS**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>81.63</td>
<td>77.04</td>
<td>41.45</td>
<td>40.27</td>
</tr>
<tr>
<td>S.D.</td>
<td>16.78</td>
<td>18.52</td>
<td>3.40</td>
<td>11.13</td>
</tr>
<tr>
<td>S.E.</td>
<td>5.25</td>
<td>2.68</td>
<td>2.47</td>
<td>1.31</td>
</tr>
<tr>
<td>N = 22 pairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

None of the t-scores was statistically significant. All the mean scores were higher for the two-year kindergarten boys than for the one-year boys, without nursery school.

Table 12 compares the scores of the one-year kindergarten girls, without nursery school, with those of the two-year kindergarten girls. Again, all of the means were higher for the two-year kindergarten girls.

For this sample of 19 pairs a t-score of 2.10 was required to meet the 5% level of confidence. The visual-motor coordination differences were short of significance since the t obtained was 2.02. The only t-score indicating a significant difference between the means at the 5% level of confidence was in visual discrimination.
TABLE 12
COMPARISON OF ONE-YEAR KINDERGARTEN GIRLS,
NO NURSERY SCHOOL, WITH PAIRED
TWO-YEAR KINDERGARTEN GIRLS

<table>
<thead>
<tr>
<th></th>
<th>Total Score</th>
<th>Visual Motor</th>
<th>Auditory Discr.</th>
<th>Visual-Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-yr. K.</td>
<td>92.68</td>
<td>91.94</td>
<td>46.64</td>
<td>42.00</td>
</tr>
<tr>
<td>1-yr. K.</td>
<td>32.52</td>
<td>30.36</td>
<td>13.31</td>
<td>9.57</td>
</tr>
<tr>
<td>S.D.</td>
<td>14.49</td>
<td>16.53</td>
<td>6.48</td>
<td>7.34</td>
</tr>
<tr>
<td>S.E.</td>
<td>3.41</td>
<td>3.89</td>
<td>1.52</td>
<td>1.73</td>
</tr>
<tr>
<td>S.D._M</td>
<td>5.42</td>
<td>2.03</td>
<td>2.95</td>
<td>1.44</td>
</tr>
<tr>
<td>t</td>
<td>1.97</td>
<td>2.32³</td>
<td>.72</td>
<td>2.02</td>
</tr>
</tbody>
</table>

N = 19 pairs
*Significant difference at .05 level

Summary

The mean chronological age of each kindergarten group was 5 years,
10 months. Twice the number of two-year kindergarten children scored above
the 75th percentile in total score on the Clymer-Barrett Prereading Battery
as the one-year children. All but three of the children who had had one
year-plus-nursery schooling were included in the upper 50 per cent. A
distribution omitting these nursery schoolers again indicated a large
number of two-year kindergarten children scoring above the 75th percentile
with fewer children in the two-year than one-year group scoring below the
25th percentile.

Total group = 62 pairs

The mean scores of the two-year kindergarten children were higher...
than the scores of the one-year children. This was true for the total group and for both the boys and girls separately. The t-values for the total group were similar except for auditory discrimination, which had the smallest t. The boys showed less differences between the groups than did the girls. None of the t-scores was statistically significant.

One-year kindergarten-plus-nursery school children and partners - 20 pairs

The low t-scores obtained on all of these comparisons suggested that these pairs' performance was more similar than the total group of 61 pairs or of the 41 pairs of two-year kindergarten children and their no-nursery school partners. The nursery school group had a slightly higher mean in: (1) auditory discrimination (total group and boys) and (2) visual discrimination (girls). None of the differences as measured by the t-test was statistically significant.

One-year kindergarten, no nursery, and their partners - 41 pairs

A few statistically significant differences between the means at the .05 level of confidence were noted when the nursery schoolers and their partners were omitted from their respective groups. These differences favored the two-year kindergarten group in the visual-motor coordination subtest and the two-year kindergarten girls in the visual discrimination subtest.
CHAPTER V

SUMMARY AND CONCLUSIONS

Restatement of the Problem

Many factors contribute to a child's readiness for learning, and they begin to accumulate at birth. The values of various school experiences in developing and expanding a child's readiness have been widely discussed and publicized. The tremendous amount of publicity which early education is receiving, curiosity, and an interest in children and how they learn, led to the design of the present study. The writer wondered if more kindergarten experience would have an effect on the results of a reading readiness test, being aware that readiness is evaluated in many ways.

Procedure

The Clymer-Barrett Prereading Battery was administered by the writer to two groups of children, and the results obtained on visual discrimination, auditory discrimination, visual-motor coordination and total score were compared. One group of 61 children, 32 boys and 29 girls, was enrolled in its first year of kindergarten. Included in this group were 20 children, 10 boys and 10 girls, who had had some nursery school experience. These experiences varied from one month to three semesters, and were gained in sundry schools and in various parts of the country. The other group of 61 children, composed of the same number of boys and girls was enrolled in its second year of kindergarten. It
was not known if any of these children had any nursery school prior to entering the four-year old kindergarten. All of the children were presently enrolled in eleven schools in one suburban school district. The tests were scored by the writer, scores were transferred to work sheets, and t-test evaluations were made.

Findings and Conclusions

Total group - 61 pairs

All of the scores of the children who had had two years of kindergarten experience were higher, but the differences were not statistically significant.

The smallest difference between the two groups was in auditory discrimination.

The differences between the two groups of girls were greater than between the groups of boys.

In this study the ranking of girls and boys, from highest to lowest mean total scores on the test, was: girls with two years of kindergarten, girls with one year of kindergarten, boys with two years of kindergarten, and boys with one year of kindergarten.

With the limitations of the study in mind, it seemed reasonable to conclude that two years of kindergarten enhanced the scores on the reading readiness test used in this research.

One year kindergarten-plus-nursery school group and their partners - 20 pairs

The scores of the children with one-year kindergarten-plus-nursery school approximated those of their two-year partners.

When only ten pairs of boys' scores were compared, it was observed
that their mean scores in visual-motor coordination were identical.

When the girls' scores were compared with the total group, the t-values were very similar.

Within the limitations of this study, nursery school seemed to enhance the scores. One year kindergarten and nursery school experience seemed to be as valuable as the two years of kindergarten for girls. However, the nursery school experiences were too varied and the sample group was too small to make further generalizations from this finding.

One-year kindergarten, no nursery school, and their partners - 41 pairs

The difference between the means of the two groups in the visual-motor subtest of the Clymer-Barrett Prereading Battery was statistically significant at the .05 level. The difference between means in the total score was close to significance. These findings suggested that two years' experience in kindergarten had improved these abilities.

The smallest differences between the two groups was in auditory discrimination.

When the boys with no nursery school were compared with their partners, the smallest difference was in visual-discrimination. The greatest difference, as indicated by the t-value, was in visual-motor coordination. However, it was observed that the mean scores of the two-year partners in this group were considerably lower than those of the two-year partners of the one year-plus-nursery-school group.

In the girls' scores there was a statistically significant difference at the 5% level of confidence in visual-discrimination. Visual-motor coordination was also close to being statistically significant.
This suggested that longer kindergarten improved visual discrimination and visual-motor coordination for the girls in this sample.

Suggestions for Further Research

1. The present study might be replicated but extended to include an I.Q. test.

2. The present study might be replicated excluding children who have had nursery schooling.

3. A follow-up study might be made to determine the relationship of length of kindergarten experience to reading achievement at the primary level.
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Tests


Unpublished Materials