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The Ability of Young Children to Recognize Words

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THE ABILITY OF YOUNG CHILDREN TO RECOGNIZE WORDS

by

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of

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

The Ability of Young Children

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The young child's ability to learn to read (defined in this study "to recognize") words was studied in an attempt to determine the influence of age.

Fourteen, three-year-old children and 16, four and one-half year old children, 14 girls and 16 boys, were instructed to read eight words. Groups of three were taught in four, ten minute sessions and were then tested one at a time for word recognition. A retention test was given two weeks later.

The hypotheses, that three-year-old children will learn to read more readily than children nearer five years old and that girls will read better than boys, were not confirmed. The four-year-old girls gained the highest scores and the four-year-olds learned an average of one more word than the three-year-olds but the differences were not significant.

It may be concluded that age and sex differences in ability to learn to read words appear to develop at a later age than three or four years. It appears, however, that learning to read words is not beyond the capabilities of three and four-year-old children. (58 pages)

INTRODUCTION

Origin and Nature of Problem

The assumption that preschool children have the ability and can be taught to read has been confirmed by research done in the past by Davidson (1939) and Terman (1925) and more recently by Fowler (1962, 1965), Durkin (1961), and Krippner (1963). Some authorities whose concern is with young children have considered such teaching to be detrimental to the development of the child. Some have expressed concern with the near point vision that has not matured enough to focus on small print until the age of five years (Eames, 1961) and the pressures that preschool children will feel if formal methods of teaching reading are adopted (Hymes, 1968). Others feel the child's physical developmental stage calls for almost continuous large muscle activity and his intellectual development needs much opprtunity for discovery of the world around him (Heffernan, 1966). A third group believes that a young child's deficiency in spoken language and comprehension of words makes reading only mechanical and devoid of meaning at so early an age. They contend that reading ability comes with less effort and with more understanding when a child is older and he may catch up and pass the early reader (Ilg and Ames, 1965).

During the last decade, because of the growing concern for helping the disadvantaged child, experimental psychologists (Piaget, 1952; Hunt, 1961; Bloom, 1964; Kagen, 1967) have promoted the point of view that intelligence is developed during the preschool years and that early stimulation may be the answer for the disadvantaged child. Programs to provide this early stimulation have included methods for teaching reading to children as young as three years of age, the age some believe children can learn this skill most easily (Doman, 1964; Moore, 1968).

The proponents of early reading refute the charges that reading is detrimental to the child's development by using large print (Doman, 1964) and they contend that no eye damage occurs from their methods (Brzeinski, 1967; Witty, 1968). Most of them do not advocate formal methods of instruction by very short periods of informal type activities (Doman, 1964; Wann, 1967). They also found, that early readers learn more readily and maintain their lead over later readers throughout their school life (Sutton, 1969).

Whether reading is the best type of mental stimulation for preschool children cannot be determined by this study. Age will be looked at to test the claims that three years is the age children can learn to read most readily. This can be important when determining the curricula of the preschool.

Statement of Purpose

The purpose of this study was to attempt to determine the influence of age on the child's ability to learn to read.

Objectives

The objectives of this study were to determine if reading words can be more readily taught to younger than to older children. Also does the sex of the child influence such learning as has been found true in the elementary school (Gates, 1961; Robinson, 1955).

Hypotheses

The following hypotheses were made:

Three-year-old children will learn to read more readily than children who are nearer five years old.

Girls will be able to read the eight individual words used in the study better than the boys.

Definition of terms

The concept "read" as used in this study means to recognize a word on sight (McKee, 1966) by whatever method a child may employ.

Methodology

The method used to teach the words during this study was not intended to demonstrate the ideal approach to teaching reading but

simply to facilitate as much learning as possible in the brief time alloted. Chall (1967) has found that the code-emphasis method in beginning states of reading produces the best results. However, whole word learning by whatever clues the child may devise without learning the letters has been used extensively (Smith, 1955). Doman (1964) used this method successfully with very young children.

REVIEW OF LITERATURE

That children are capable of learning to read at an early age has been demonstrated in various studies. Terman (1925) studied 552 gifted children of which 250 had learned to read before five years of age, 6 percent before four years and 1.6 percent before three years of age. Davidson (1939) found that children with a mental age of four years, dull, average and bright in ability could learn to read words. The bright three-year-olds in the study were superior in reading achievement to the older children and after only three months their average score was 4.8 points above the norm for mid-first grade. Kasdon (1958) reported that 21 out of 50 college freshmen who were superior readers had learned to read before the first grade.

Fowler (1962, 1965) taught two and three-year-old children to read. He concluded that early and prolonged stimulation in fine visual perception-motor discriminations can be carried out by a child from the ages of two to five without evident appearing of eye injury or physical disability. He said that frequently a child would improve in his general mood as a result of participation. Krippner (1963) reported on a boy who read at eighteen months. At the age of four years, two months he could read on second and third grade levels. Doman claims:

> Children can read words when they are one year old, sentences when they are two years old and whole

> books when they are three years old--and they love it. (Doman, 1964, p. 1)

The question of the feasibility of teaching children to read before the first grade has been given much attention in recent years, with the focus on early cognitive development resulting from Piaget's influence and the widespread recognition of the problems of the culturally disadvantaged child. Pines (1966, p. 1) brought the issue to a head by saying that the single most useful thing that can be done for culturally disadvantaged youngsters is to teach them to read before they enter school. She said, "Our severest educational problems could be largely solved if we started early enough."

Opposing this viewpoint are many authorities in fields of child development, education, pediatrics, psychology and neurology. They voice fears that pushing children into reading at an early age may be detrimental to the development of the child. Their chief target is the introduction of formal methods of instruction in the kindergarten and preschool which would subject young children to pressures for which they are not ready. Hoppock (1966) in arguing against formalized reading instruction in kindergarten before the New Jersey State Department of Education stated that most children subjected to systematic teaching are made to perform meaningless tasks, are placed under physical and psychological pressure and are exposed to early failure. She quotes Dr. Catherine Spears, a neuro-pediatrician, who believes that we are on the wrong track in moving toward an earlier introduction

of an academic curriculum. Dr. Spears sees many panic stricken parents trying to make their children adults almost before they are born, which results in her child patients developing peptic ulcers, psychosomatic complaints and learning difficulties. Hoppock also mentions Dr. Julius B. Richmond, Chairman of the Department of Pediatrics, College of Medicine, Syracruse, New York, as warning against setting expectations which create emotional problems and learning difficulties. He feels many subtle psychosomatic problems of young children are in response to the intensity of pressures placed upon them. One way a child has of defending himself against the tremendous pressure to learn, Dr. Richmond claims, is to refuse to learn, usually at an unconscious level.

Heffernen (1966) points out that while children may seem to suffer no damage at the time, in two or three years the enrollment of patients in psychological clinics who have a previous history of being taught reading early has definitely increased.

A second argument against early formalized reading is that reading is part of a more or less predetermined pattern of growth which will emerge under favorable conditions. Strang, McCullough and Traxler (1964) indicated that the child may be stimulated for a short time to exceed his natural rate of development, but special instruction, maturation or medication will produce only a temporary spurt. The child, she continues, quickly resumes his original growth pattern. A child will grow in

reading ability at his own natural pace regardless of any attempted training that is premature. This theory of pacing is expressed this way by Hymes:

> Each child must set his own pace. The urge to read blossoms in different children at different times . . . forcing all children to begin at the same time hurts too many youngsters and spoils reading for too many. (Hymes, 1968, p. 38)

Closely related to the above is the additional argument that teaching reading will keep young children from having the opportunities for active, creative, social and multisensory activities they need for good learning now and later. Osborne (1966), a psychologist for Head Start, wonders why our nation is so fixated on reading. He says that a child of three may know how to read, but still doesn't know how to get along with others. Hymes suggests that:

> a good classroom can be geared to illiterates. It capitalizes on what children can do. They can see, they can hear, they can ask, they can touch, they can talk... It makes the most of the powers they do have to teach them no end of worthwhile learnings. (Hymes, 1968, p. 38)

Ilg and Ames (1965), p. 324) emphasized that, "play is the pre-schooler's work. Let's not worry that he is wasting his time."

The visual hazards of close work on young eyes is another real concern. A young child is normally foresighted and reading forces attention on near and very small symbols. A pre-requisite for reading, according to Strang et al. (1964) is that both eyes act together and their binocular acuity at reading distance produces clear vision. She continues:

> Visual acuity tends to develop over several years. A kindergarten child generally cannot read print that is smaller than 24 point, i.e. three-eights inches in height. Visual clarity increases further as the eyes acquire ability to adjust to distance accommodation and convergence. To receive clear image of the printed word, the eye must focus on or converge on it. Children under four years of age usually lack this ability. However, most children have acquired it by five. Children reach a peak in their power of convergence by fourteen or fifteen years of age. The reader must not only focus in words and distinguish them from the background, he must fuse the separate images from each eye into a single clear image. Otherwise the words blur. This neuromuscular skill basic to word discrimination is primary to reading. (Strang et al., 1964, p. 16)

Hoppock (1966) quotes Dr. Kenneth Zike, Head of the Department of Pediatrics at Harbor General Hospital in Los Angeles who says:

> Only 25% of children in kindergarten have reached a degree of neurological maturity to cope with the symbolization necessary for reading. The eye may be able to receive the visual image but for more than 75% of the children, the neurological system has not reached the maturity to make connections between what they see and what they understand. There is nothing that can speed up this readiness--only time can do that. (Hoppock, 1966, p. 19)

The clinching argument against early reading, however, is that research has not provided evidence that early systematic reading instruction greatly accelerates reading achievement. Halliwell and Stein (1964) comparing early and late school starters in the fourth and fifth grades found that pupils who entered school early were significantly poorer in reading achievement than were pupils who entered school later. Ilg and Ames (1965) claim that research has shown that most efforts at setting up formal reading instruction in the preschool years do not succeed in teaching the child to read. Even if they do,

they say, such a child's advancement over his contemporaries is usually not maintained. Other bright members of his class group will quickly catch up and even surpass him once the class has reached the customary time for learning to read. Mason and Prater (1966) came to the conclusion from their study, that when exposed to the same program younger children make less progress than older ones with similar levels of intelligence, and Hoppock (1966) does not feel that early reading necessarily means faster progress. Hymes says that:

> The most precocious of these early readers are still in the dog-paddling stage. They are a far cry from being able to get from the printed page the rich flood of stimulation all children need. (Hymes, 1968, p. 37)

Zigler (1970) feels a middle course between the two extreme views of child development is the answer. He acknowledges the importance of intellectual development during the child's early years but would like to see this concern extended to include also the child's emotional and social development. Since these factors influence how well a child learns, they need equal emphasis. He claims that only by consciously directing our efforts to the development of both of the aspects of human growth will we be producing the kind of individuals our society badly needs.

The proponents of early reading are reflecting the influence of Piaget whose discovery that the stages of intellectual growth in children are not just a matter of unfolding maturity as Gesell had indicated but

result from the interaction between the child and his environment. These stages, Piaget (1952) says, occur in the same sequence but not always at the same chronological age. Stimulation that is appropriate for his stage of growth needs to be given to the child so the interaction with his environment will insure maximum mental growth. Deutsch expressed it like this:

> Apparently it is not sufficient to provide particular stimulation for the growing individual, but it must be supplied at a special time or within particular time limits, if it is to have the most desired effect... Experience missed at one developmental level cannot be adequately retrieved at another level; later development must be stimulated by experiences that are consistant with the individuals status at the later time. (Deutsch, 1964, p. 256)

Bloom (1964) believes that the early environment is of crucial importance because of the very rapid growth of selected characteristics in early years and that this environment shapes these characteristics in their most rapid periods of formation. The environment, he continues, will have maximum impact on a specific trait during that trait's period of most rapid growth. He feels that as time goes on more and more powerful forces are required to produce a given amount of change in a child's intelligence.

Montessori (1949) felt that the young of any species had periods of sensitivities to particular environmental stimuli. She believed that once the absorbant period is past, the time of easy learning is over and what has not been acquired then, can later be acquired only with conscious effort. Hunt (1961) calls this the "problem of the match" which

he defines as the most stimulating circumstances for each child at that particular point in his development. He says that a good match produces so much intrinsic motivation and pleasure that it becomes unnecessary to worry about pushing children.

How early should there be intervention in the lives of children to stimulate this mental growth that is so essential? Edwards (1968) says as early as eighteen months disadvantaged children start trailing their middle-class age mates in tests of general intelligence and language development. Deutsch (1964) feels that organized and systematic stimulation through a structured and articulated learning program at the three and four-year-old level would most successfully prepare the disadvantaged child for school. Montessori (1949) emphasized self-directed and self-selected materials and activities carefully programed in sequence for children three to six. She advocated reading as one of these activities because she discovered that the children would soon beg to learn these skills.

Moore (1968) reports that the younger children started using his talking typewriter in learning to read, the better they did. He says:

> They have an easy, natural swing to their behavior. The older ones are more careful and deliberate. But a three-year-old will act as if he weren't paying attention. At that age they can tolerate a great many more errors than older children. A six year old was afraid of making mistakes and needed constant assurance. I wouldn't pit myself against a three-year-old in meeting an utterly new problem or new environment. You've got your top notch problem solvers there... By the time he enters school his ability to attain the sort of relaxed and exploratory state of mind required to enable him to make his own discoveries is impaired. (Moore, 1968, p. 188)

Doman (1964) thinks it is astonishing that it has taken us so long to realize that the younger a child is when he learns to read the easier it will be for him to read and the better he will read. Beyond two years, he says, reading gets harder every year. Tests given to young readers by Ayers and Powell (1969) showed that three-year-olds who studied the same reading material as five-year-olds made a score of approximately 84 percent of what five-year-olds achieve.

Although some advocates of early reading, such as Crane and Longenecker (1969) and Bereiter and Engleman (1967) believe that a formalized and highly structured reading program is more effective at the preschool level, most authorities would make early reading instruction informal, utilizing the young child's natural interests and mode of learning. Studies indicate, according to King (1969) that children who learn to read at an early age before coming to school do so in a manner which is quite different from the way they are taught at school. Also, the materials are quite different. Kagen (1967) advocates development of the environment for creative enjoyable learning without pushing. Wann (1967) concluded that reading should be taught in kindergarten but the approach should be appropriate to the way five-year-olds learn by emphasizing manipulative materials, keeping the program from becoming highly abstract, avoid pushing children, and provide a balanced kindergarten day. Brzeinski, Harrison, and McKee (1967) found no evidence that early instruction in beginning reading caused dislike of reading and Robinson and Robinson (1968) felt it

difficult to conceive how pleasant experiences of a stimulating nature can be harmful to mental health.

The problem of eye injury from early and prolonged stimulation in the fine visual perception-motor discrimination of reading is refuted by Witty (1968) and Brzenski, Harrison, and McKee (1967) who found that no evidence was found that early instruction in reading affected visual acuity in the Denver kindergarten experiment. Fowler (1962) made the same statement in teaching two and three-year-olds. Eames (1959), an optholmologist, found little difference in the incidence of central tendency of visual acuity among school children who were reading failures and unselected school children. In studying 899 five-year-olds he found none who scored below the minimum of binocular accommodation which he considered essential for reading. Girls were superior to boys; suburban children to urban, he added, and gifted children tend to be visually as well as intellectually a little more mature than average. In teaching very young children, Doman (1964) solves the visual problem by using large printing. He feels the only reason two-year-olds haven't discovered reading on their own is because the print has been too small.

Many studies in recent years show results in direct contrast to those which contend that the early reader does not maintain his lead and is often surpassed by late learners. Durkin (1961), in her study of children who read early, found that the earlier the beginning experience in reading the better was the reading attainment even beyond the

first grade. The brighter children read at the most advanced level, but all of the early readers achieved significantly higher in reading than equally bright non-readers. In 1966 she reported on the reading achievements of these same children after five or six years of school instruction. The early readers were significantly higher than the average reading achievement of equally bright classmates who were not early readers.

Sutton (1969) compared children who learned to read in kindergarten with those who had no kindergarten or kindergarten without reading instruction and found that at the end of grade one they were achieving reading equivalents at an average grade level one year ahead of the others. At the end of grade two they were seven months ahead and at the end of grade three they were one year and four months ahead, indicating that the advantage continued and increased as they progressed. Bryseinski, Harrison, and McKee (1967) reported on the Denver experiment of teaching reading to children in kindergarten. The kindergarten children showed greatest initial and long range gains in both comprehension and vocabulary and read at a greater speed at the end of third grade than control groups. Morrison, Colmen, and others (1970) in testing reading performance of disadvantaged early and non-early readers from grade one through grade three concluded that early reading skills are not detrimental to long range achievement and instruction is desirable for disadvantaged children.

A different point of view on the subject of early reading is expressed by Furth (1970). He feels that according to Piaget's theories reading is a low-level operational task and rarely uses the child's available operative structures to full capacity. He says reading as such is not an intellectually difficult skill. A mental age of four years is ample as far as I.Q. is concerned. On the other hand, a mental age of eight or nine is certainly not too late for starting reading. His contention is that early reading does not have an intrinsic relation to intelligence and that its one-sided emphasis in school implies an under-emphasis of intellectual development. He is not against reading, particularly if learning to read takes place in a setting that puts no undue stress on the child, but neither the process of reading itself nor the comprehension of its easy content can be considered an activity well suited to developing the mind of the young child. Reading, he continues, like any specialized learning, presupposes a motivation primarily of a different sort from the motivation underlying a child's capacity to think. Reading is learned because a child wants to please his parents, to imitate his peers, or to explore the contents of books. Thus the motivation for reading lies outside the reading process; it is extrinsic. A child's reading difficulties are most likely due to lack of motivation or to faulty learning habits and should not be attributed to lack of intelligence.

Furth quotes Dr. D. B. Harmon to explain why visual defects sometimes appear:

> It is inappropriate to stress near vision until the visual system approaches full development and that for its development it needs the active use of far vision...most of these defects are not so much the cause of reading difficulties as the result of early learning that was physiologically unsound. When a young child experiences stress in connection with having to learn to read, this psychological stress reinforces the already existing physiological stress (due to near vision activity). Later on, the functioning of the child's visual system will be found to be faulty, and visual training will be recommended to undo the harm of earlier learning...stressful close visual work in early reading is harmful; when it is obvious, a sensitive teacher should be able to tell the child, 'Stop reading'. (Furth, 1970, p. 147)

In explaining the relationship of reading to intelligence Furth recognizes them as different psychological phenomena. Reading first requires the figurative ability to comprehend an arbitrary symbolic code, and this ability begins to be evident in the pre-operational period of symbol formation. Consequently it is no miracle that a three or four-year-old child can read words. Second, reading increasingly requires the operative ability to comprehend verbal propositions. This ability is not fully developed until the formal operational period. Thus between the ages of eleven and thirteen years reading and thinking can join together and expand the intellect of the reader. Not knowing how to read becomes potentially harmful to the intellect at the formal period but is of no particular consequence for the developing intelligence at earlier ages.

The literature pertaining to early childhood reading is extensive and involved in many theories. Much research has been carried out with directly conflicting results and claims have been made that are

not supported by research. Authorities on both sides of the controversy seem concerned about the damage that too much pressure can have on young children, but disagree as to the causes of pressure. Each side holds the optimum development of the child to be of primary importance and considers the age when reading is taught to be related to this development.

I conclude from this review that the damage suffered by many children has not come from the act of reading in itself at any particular age, but from the psychological pressures experienced by the children while being taught to read regardless of age. In a pressure free environment then, children can be motivated toward reading and be taught by informal methods whenever they show they are interested. A knowledge of the age when reading is most easily learned becomes important in structuring this environment.

RESEARCH PROCEDURES

Sample

Thirty children from the Child Development Laboratory at Utah State University took part in this study. There are four preschool classes included in the Child Development Laboratory that meet Monday through Thursday each week for approximately two and one-half hours. There are two rooms, each with a morning and an afternoon group of twenty children. These children represent an essentially middle class Caucasian population with parents who are interested in education as indicated by the fact that many of the children were put on the waiting list for entry into the laboratory school soon after their birth. The children in this study then are representative of the laboratory group and do not represent all Cache Valley children or all three and four-year-olds.

The selection of the sample children was on the basis of age and sex. The youngest three-year-olds and the oldest four-year-olds enrolled in the laboratory were divided as equally as possible by sex and convenient groupings within the four sessions of the laboratory school. Since the design of the study called for three children in each instruction group, it facilitated the mechanics of the study to have the members of each group within one particular laboratory class. Consequently, 14

girls and 16 boys participated; 7 three-year-old girls and 7 three-year-old boys, 7 four-year-old girls and 9 four-year-old boys.

The ages ranged from 3 years, 1 month to 3 years, 7 months for the three-year-olds and 4 years, 5 months to 4 years 8 months for the four-year-olds. An average interval of 1 year, 2 months existed between the two groups (Figure 1).

Instrument

Eight cards, 5 inches by 8 inches were printed with one word on each card, in letters 1 1/4 inches high. The word was centered on the card with 1/2 inch between each letter. These cards were used during each teaching session. Similar cards were available for each child to keep for his own. The words printed on the cards were: "mommy", "daddy", "refrigerator", "red", "jump", "shoes", "me", and "puppy" (Figure 2).

Administration

A pilot study was made with a group of children who were not included in the sample, to determine if the procedure design was workable. The procedure was adapted from Coleman (1970), "Collecting a Data Base for a Reading Technology," and consisted of the following steps:

1. Pre-test. The eight words selected for this study were shown to each group of three children, one word at a time. The children

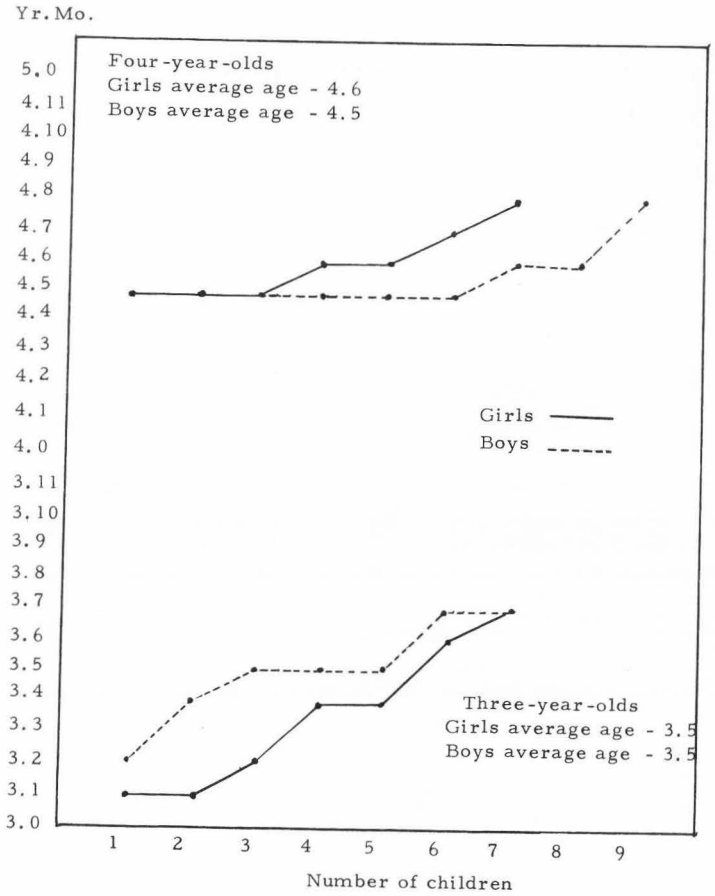

Figure 1. Comparison of the ages of the children.

Figure 2. Word card printed in actual size.

were asked each time, "What is this word?" Since none of the children knew any of the words, the original selection of words was retained for the study.

2. Phase 1. The children were taken in groups of three to a room separate from the Child Development Laboratory to avoid distraction and allow them opportunity to concentrate on the lesson. The composition of each group varied with each session depending on which

of the sample children were present and free to come at that particular time. The experimenter began each ten minute session by saying:

> We are going to learn to read these words.
> It's easy to read.
> You can learn to read words.
> Words tell you what to say.
> Each word tells you something different.
> You have to learn what each word tells you what to say,
> and then you will know how to read.

She placed the word-card "mommy" before the children, pronounced it, used it in a sentence, and asked each child to repeat it in turn twice. Then the word card "daddy" was presented in the same manner. The two cards were held up and the children were asked if they could see anything similar about the words. The "y"s were identified. Then they were asked to find the word with the tall letters and remember the tall letters are in the word "daddy" just as their daddies are tall.

The word "refrigerator" was presented in the above manner. The children were asked, "What is different about this word?" The answer was usually, "It's so long." The last word presented in this session was "red", which the children said was a little word.

The four word cards were placed on the table and read by the experimenter. Then the children were asked one at a time to point to them as they were asked, "Show me the word mommy," etc. When they seemed to be making correct responses, the cards were put together and the experimenter flashed them one at a time and called on a child to read them. If the child read the card correctly he was given a similar word card to keep as his own. Since it would have been

extremely distressing for a child to have been deprived of possessing a set of these cards when the others were allowed this privilege, a situation which could have affected his attitude and learning in the sessions, he was given other chances to read the word if he missed it the first time. The children were given a choice of writing their own names on the cards or having the experimenter write them. Only one child could write his own name at this time. The cards were supposed to go home but in several cases they were found later in the child's locker.

The second ten minute session of Phase 1 was held within two or three days of the first session. The four words were on the table when the children arrived. Invariably a child would say, "I know those words" and proceed to read them. The experimenter then asked individual children the following questions to be answered by pointing to the correct word-card:

Who takes care of you?
Where do you keep the ice cream?
What color is a fire engine?
Who goes to work each day?
What is your favorite color?
Who cooks your dinner?
What makes ice cubes?
Who do you have fun with?
Who puts you to bed?

The cards were then put together and given to one child who flashed them to another child of his choice. Each had a turn to flash the cards and then the experimenter flashed them to each child.

3. Phase 2. The first session of this phase was conducted in a manner similar to the first session of Phase 1 except that the other four words were used: "jump", "shoes", "me", and "puppy". After the word "jump" had been presented, used in a sentence and repeated twice by each child, the experimenter said, "Look at the first letter and pretend a little boy is running along this path. He comes to a big puddle and has to jump over to this rock." She pointed to the dot over the "j". To present the word "shoes" she asked the children to find two letters that were alike. When they identified the two "s"s, one on each end, she asked them to remember that they have two shoes just as the word has two "s"s. The word "me" was presented as a small word and the word "puppy" as a word with letters that look something like letters in the word "daddy". They were asked to remember that puppies are small and down on the floor and the letters in the word point down but the letters in "daddy" point up where their tall daddies are.

The second session of Phase 2 followed the procedure of Phase 1, session 2, except these questions were answered by the child called upon to point to the appropriate word-card:

What barks?
What do you wear on your feet?
Who likes candy?
How do you get across a creek?
What do you like to buy?
Who likes to come to nursery school?
Who wags his tail?
How do you get off of a stool?

After the four words were flashed by the experimenter the first four words were reviewed briefly and then mixed with the second four and flashed to each child.

4. Phase 3. This phase consisted of a test that was given to each child who was alone with the experimenter. The eight cards were laid on the table in a random order. The child was asked to pick one card at a time, read it, and hand it to the experimenter.

The order of the cards as they were picked up was recorded, as well as the substitute words used for cards that were misread.

5. Post-test. A test for retention was given two weeks after the Phase 3 test. This was administered and recorded in the same way.

FINDINGS

Analysis of Data

The hypothesis that three-year-old children will learn to read more readily than children nearer five years old was not confirmed by the data collected. The average number of words learned by the total group on both the post-test and the retention test was 6.6 out of the eight words. The four-year-old children achieved an average of 7.0 words on the post-test and 7.18 words on the retention test as compared with an average of 6.14 words for the three-year-old children on the post-test and 5.93 words on the retention test. This indicates that the four-year-olds learned an average of one more word than the three-year-olds, and at the end of two weeks their retention had improved while the three-year-olds lost slightly on the retention test (Table 1 and Figure 3).

The second hypothesis, that girls will be able to read the eight individual words better than the boys, was not confirmed. The four-year-old girls read an average of 7.28 words on the post-test which rose to 7.43 out of the eight words on the retention test. This compares with a slightly lower average for the four-year-old boys of 6.77 and 7.0 words on the retention test, but the difference is not enough

Table 1. Average number of words learned

	Post-test	Retention test
Total group	6.60	6.60
Girls	6.71	6.71
Boys	6.50	6.56
Four-year-olds	7.00	7.18
Three-year-olds	6.14	5.93
Four-year-old girls	7.28	7.43
Four-year-old boys	6.77	7.00
Three-year-old girls	6.14	6.00
Three-year-old boys	6.14	6.00

to be significant. The three-year-old girls and boys, read an equal number of words, averaging 6.14 on the post-test and dropping to 6.00 words on the retention test.

In comparing the words read in each phase of the study to see which were learned best, there was no significant difference. An average of 24.6 Phase 1 words were learned by 30 children, compared with an average of 24.7 words for Phase 2 (Figure 4).

An analysis of the individual words learned by each group of children is of interest. The word "jump" was read by every child on both tests. The word "refrigerator" was missed only once by one child who substituted the word "deep freeze" on the post-test but corrected it on the retention test. The word "red" was confused with the other short word "me" five times on the post-test but only twice on the retention test. The gain that was made by the three-year-olds was

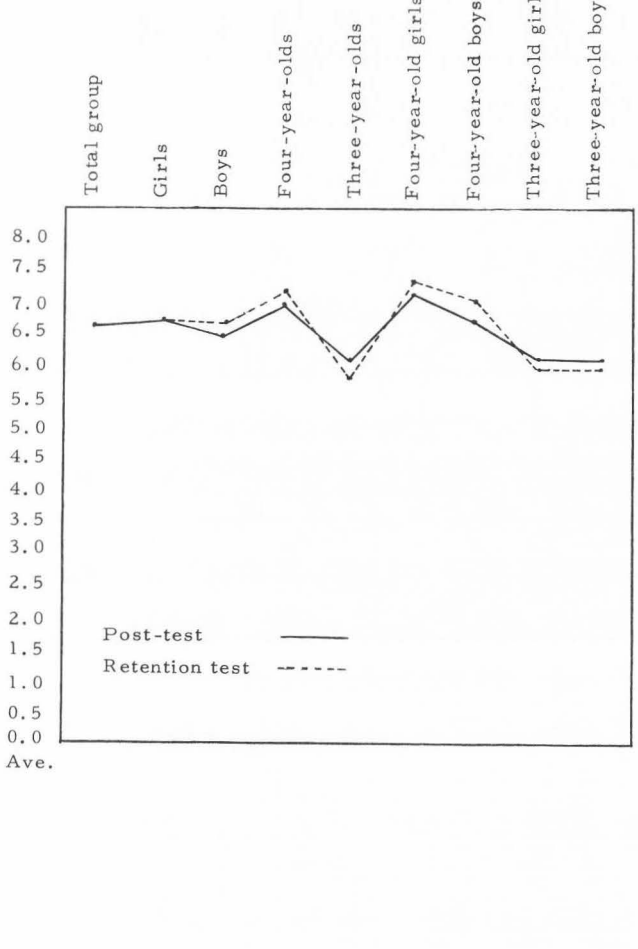

Figure 3. Average number of words learned.

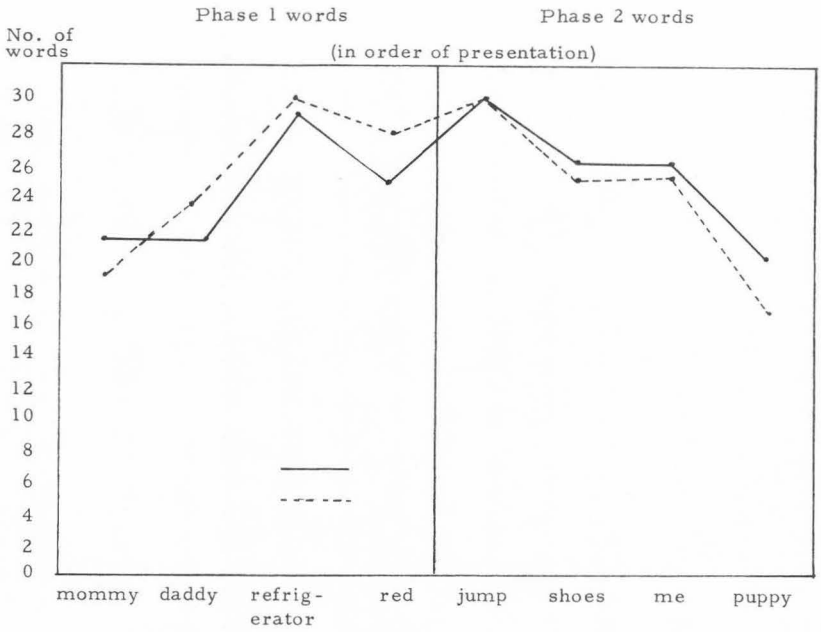

Figure 4. Comparison of Phase 1 and Phase 2 words learned.

probably a result of the maturing of their concept of the color red during the two week period because the teaching of color concepts is part of the laboratory curriculum.

The word "shoes" was misread four times on the post-test with "mommy" and "daddy" being substituted. The four-year-old girls made no errors on this word. The three-year-old boys did not do as well on the retention test as the post-test for the word "shoes". The word "me" was also misread four times on the post-test, the word "red" being substituted. On the retention test "red" was used only twice, but "you", "shoes" and "doggy" were given. Four-year-old girls made no errors on the first test but slipped on the retention test as the other groups did, except for the three-year-old boys who showed a gain.

The children were more confused by the words "daddy", "mommy" and "puppy" than any of the other words. The children identified the similarity of the final "y" in each word. "Daddy" and "mommy" were each missed nine times on the post-test and "puppy" ten times. The only words taught on which the boys made more correct responses than the girls were "mommy" and "puppy". However, this gain was lost on the retention test and more correct responses were recorded for "daddy". All of the four-year-old girls read "puppy" correctly on the retention test.

The words "puppy" and "mommy" were confused nine times on the two tests and "puppy" and "daddy", nine times, also. "Mommy" and "daddy" were confused only four times. These results indicate

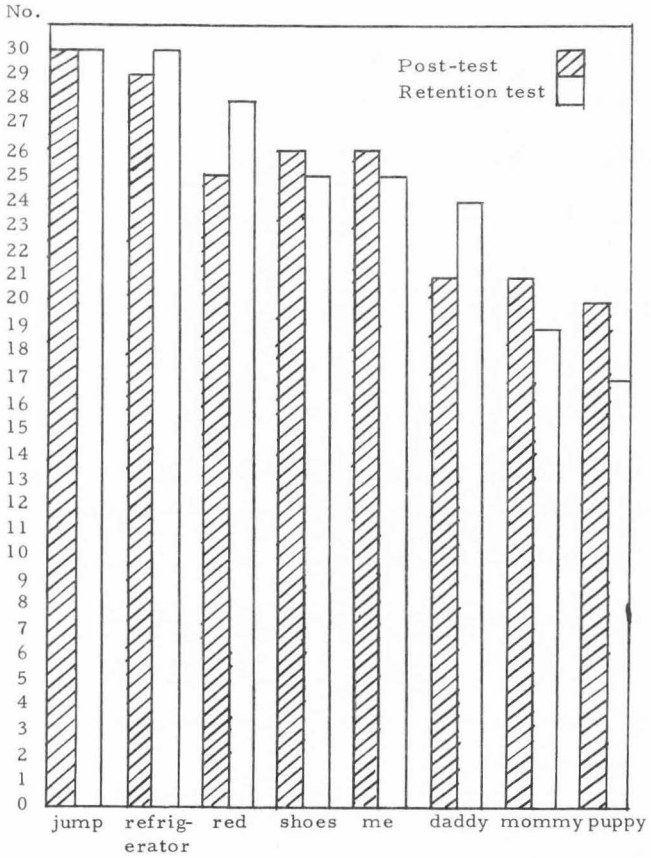

Figure 5. Number of correct responses by the total group on the post-test and the retention test.

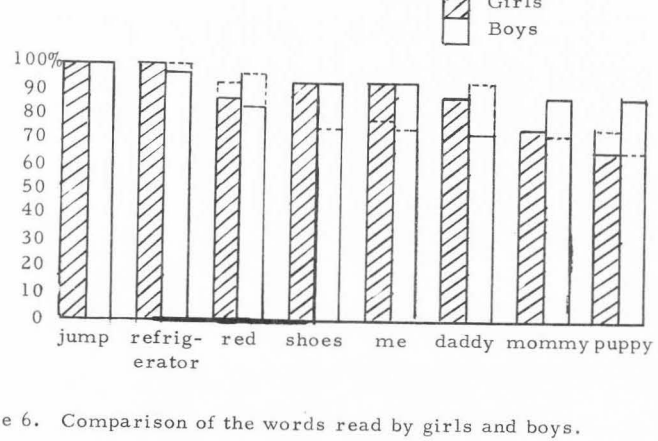

Figure 6. Comparison of the words read by girls and boys.

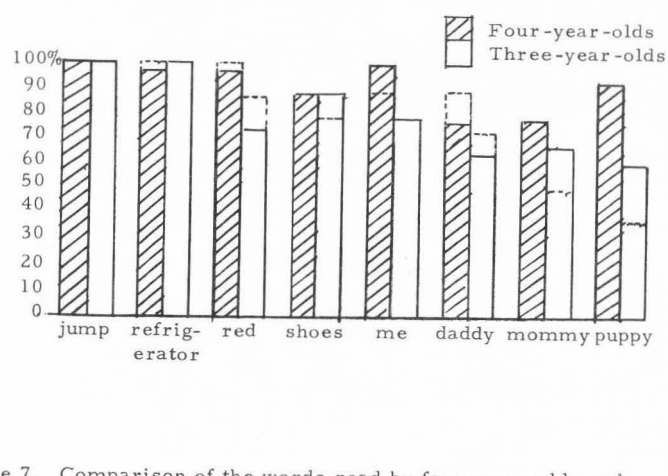

Figure 7. Comparison of the words read by four-year-olds and three-year-olds.

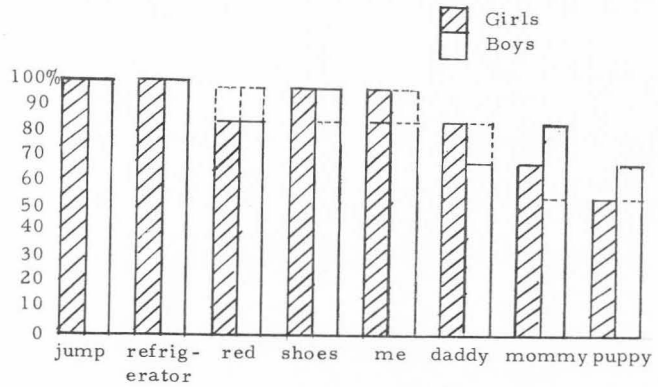

Figure 8. Comparison of the words read by three-year-old girls and boys.

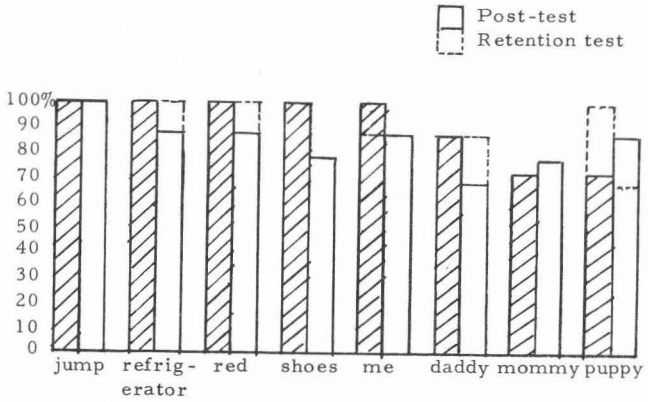

Figure 9. Comparison of the words read by four-year-old girls and boys.

Table 2. Words used as substitutes

Word	Substituted words and frequency
jump	none
refrigerator	deep freeze (1)
red	me (6) dog (1)
shoes	mommy (4) daddy (2) dog (1)
me	red (5) you (1) shoes (1) puppy (1)
daddy	puppy (9) mommy (5) doggy (1)
mommy	puppy (9) daddy (5) dog (1) me (1)
puppy	daddy (10) mommy (9) shoe (2) me (1)

that guessing was employed in most cases when they were missed and accounts for the big differences recorded for these words between the post-test and the retention test.

The number of words learned by the total group of 30 children was 198 out of a possible 240 words. The totals were the same for both the post-test and the retention test. The loss in some words over the two week period was gained in others. Losses were seen in the words "shoes", "me", "mommy", and "puppy" and gains were made for "refrigerator", "red", and "daddy". The girls learned 85 percent of the words and the boys 81 percent and 82 percent on each of the tests. The four-year-olds achieved 88 percent and 90 percent as compared with 77 percent and 74 percent for the three-year-olds (Figure 10).

The words learned best were "jump" and "refrigerator". The girls learned "shoes", "red", and "me" in that order next, but the boys

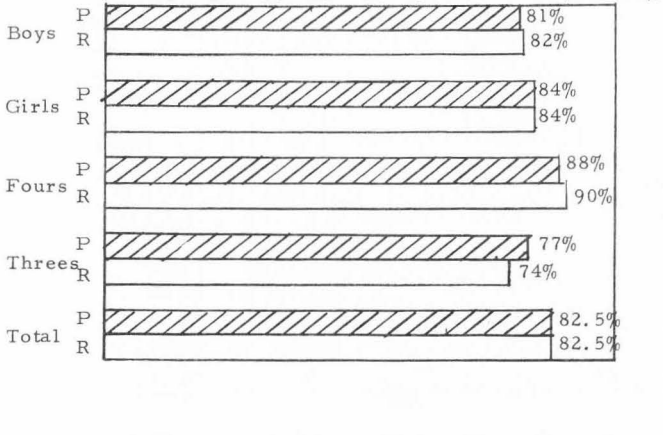

Figure 10. Percentage of words learned.

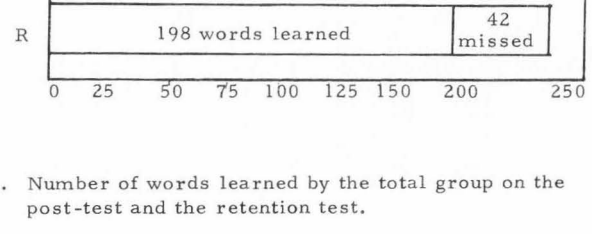

Figure 11. Number of words learned by the total group on the post-test and the retention test.

reversed the order and learned "red", "me", and "shoes" next. "Daddy", "mommy", and "puppy" were learned in this order in last place by all of the groups, except the four-year-old girls whose poorest score was on the word "mommy". However, this was a higher score than the other groups had for this word.

In comparing the best learned words with the order in which the words were picked up by the children to read: "jump", 16 times; "refrigerator", 12 times; and "shoes", 10 times, were most frequently read first, also. This pattern emerged from the tabulations in spite of the experimenter's observation that the children seemed to pick up whichever word was nearest to them on the table. Baldwin (1960) found that when a child is offered a choice between two alternatives to determine preference, he may pick up the first alternative he sees without ever looking at the other one. He suspects that a child's final behavior is more accidental than deliberate. "Jump" and "refrigerator" were also the leading choices for second and third words picked up so it appears to have been more than accidental (Table 3).

Eight children read all of the words correctly on both tests. Two were three-year-olds, a boy and a girl, and three girls and three boys were four years old. However, there were 16 children out of the 30 who correctly read all of the words on one of the tests. Eleven of these were four years old and five were three years old, nine boys and seven girls. Five children missed one word, five missed two words.

Table 3. Frequency and order in which words were picked up

First		Second		Third		Fourth	
jump	16	jump	11	jump	9	refrig	9
refrig	12	refrig	10	refrig	8	me	9
shoes	10	me	9	red	7	shoes	6
me	5	red	8	me	7	puppy	6
red	4	daddy	4	daddy	7	daddy	5
mommy	4	puppy	4	mommy	7	jump	5
puppy	3	shoes	3	shoes	5	red	4
daddy	2	mommy	1	puppy	4	mommy	1

Fifth		Sixth		Seventh		Eighth	
red	7	shoes	14	jump	7	refrig	9
daddy	7	red	8	red	6	mommy	6
mommy	7	jump	7	me	6	red	5
refrig	6	daddy	7	puppy	6	shoes	4
shoes	5	mommy	7	refrig	4	me	4
me	5	puppy	4	shoes	3	daddy	4
jump	4	me	2	mommy	3	puppy	4
puppy	3	refrig	0	daddy	2	jump	1

One three-year-old boy who had been absent frequently and consequently had abnormally long intervals between teaching sessions and missed most of the group sessions, missed five of the words (Table 4).

The hypothesis that three-year-old children will learn to read more readily than children nearer five years old was not confirmed by this study because the difference in the number of words learned by each group was so small, an average of one word, that it does not confirm that there is very much difference in the ability of the two ages.

Table 4. Number of errors made on the best of the two tests

	Number of errors								
	0	1	2	3	4	5	6	7	8
Total group	16	5	5	3	0	1	0	0	0
Boys	9	3	1	2	0	0	0	0	0
Girls	7	2	4	1	0	0	0	0	0
Fours	11	3	1	1	0	0	0	0	0
Threes	5	2	4	2	0	1	0	0	0
Girls four	5	1	1	1	0	0	0	0	0
Boys four	6	2	0	1	0	0	0	0	0
Girls three	2	1	3	1	0	0	0	0	0
Boys three	3	1	1	1	0	1	0	0	0

The high percentage of words learned by both groups of children (82.5 percent) after four ten minute teaching sessions indicates how easily pre-school children can learn to read whole words. This is consistant with Piaget's statement when interviewed by Hall (1970), that reading ability may not be related to mental age and to Furth's observation (1970) that reading is a low-level operational task for which a mental age of four years is ample.

Discussion

Reactions to individual words

Helping children learn the "whole words" by providing them with specific clues had interesting results. Using the story of a little boy

running down a path and jumping over a puddle to a rock for the word "jump" was apparently effective since every child remembered this word. Of course, this was the only word containing a "j", and the only word that could be demonstrated by action.

The word "refrigerator" was used to determine if the length of a word would affect learning. It was a very obvious clue and the children learned the word in its first presentation, however, it was difficult for many of them to pronounce. The child who called it "deep freeze" throughout the sessions had an especially hard time pronouncing it when he decided to try it on the retention test. Although it was obvious he knew the meaning of the word on the post-test since he said "deep freeze", it was counted wrong.

The word "red" did not have meaning to some of the three-year-olds who had not yet mastered color names. They sometimes would call it "fire engine" which had more meaning as far as color was concerned. Ashton-Warner (1963) demonstrated how much easier it was for children to recall meaningful words. Since these children were attending the demonstration laboratory school and receiving instruction in naming colors, this probably accounted for the gain on the retention test.

Using the "s-s" on each end of "shoes" did not seem to be a very clear clue, probably because more letter discrimination ability was needed to see the "s" and the fact that there were two of them could have been related in the child's mind to things other than shoes.

Teaching the pronoun "me" proved difficult, since, when the experimenter pointed to herself to indicate the meaning of the word, the children would call it "you". It was confused most often with "red" probably because they had both been identified as short words during the teaching sessions.

The word "puppy" was included to see if the children could distinguish it from the word "daddy". The fact that it would be confused with "mommy" also had not been anticipated. Distinguishing "mommy" from "daddy" was done on the basis of the fact that daddies are tall like the letters in the word and all the letters in "mommy" are short. However, in presenting "puppy" and emphasizing that the letters point down to a small puppy as contrasted to the letters in "daddy" pointing up, the fact that both "puppy" and "mommy" are flat on top was ignored, and the children who were using the absence of tall letters in "mommy" to distinguish it from "daddy" were then confused as the results show. Using a completely different clue for "mommy" would probably have shown different results.

"Puppy" was not a good choice of a word as far as meaning was concerned because so many children called it "dog" or "doggy". The word "puppy" evidently was not a part of their vocabulary.

Attitudes of children

The attitudes displayed by the children during the teaching sessions were observed. The majority of the children reacted as they

would to playing a game; it was a new experience and fun. Many showed pride in their ability to read, saying, "I can read those words." A few were more interested in the things in the room (the library where books, pictures, rhythm instruments, etc. were stored) which were very inviting. Three children were very shy and would point to words they knew but said very little.

They were very excited about taking the word cards with them and displaying them to other children. One child was challenged by another, who was not in the sample group, that he could not read the words on the cards. The argument that ensued finally called for the intervention of a teacher.

One mother was so impressed with her daughters' progress (she had one in each age group) that she decided to continue teaching them at home. This was discouraged by the experimenter unless she made it very informal and only when the girls displayed an interest.

The experimenter recorded the teaching sessions on tape in the hope that the children's reactions to the sessions might reveal differences in attitude. However, outside of an evidence of good cooperation and enjoyment in the activities, little of significance was revealed.

Another study was being conducted by another experimenter using children from one of the laboratories while this study was in progress. Two of the children who were involved in both of these studies showed some reluctance to leave their free play activities to come to the teaching sessions. This was understandable because it resulted

in very little time left for free play on those days. All of the other children seemed agreeable and anticipated leaving their classes.

Abilities of Girls and Boys

The fact that the four-year-old girls were slightly ahead of the four year old boys while the three year old boys and girls were equal in their ability to read words may be of importance, but the difference found was too small to be reliable. Additional testing will be needed to determine reliability. This may, however, turn out to be an indication of the base line for the beginning of the divergence in reading ability that is so pronounced by the time boys and girls reach first grade (Robinson, 1955; Gates, 1961). This may imply that differences in reading ability that occur in later school years could be the result of sex-linked activities pursued by boys and girls during pre-school years rather than the physical and mental maturity attributed to the readiness of girls for reading before boys (Ilg and Ames, 1965).

SUMMARY AND CONCLUSIONS

Summary

The familiar idea that reading at an early age will be detrimental to the development of the child has been challenged in recent years by psychologists who feel early intellectual stimulation is manditory for the maximum development of the child. Reading has been proposed by some as one of these means of stimulation. Claims have been made, also, that a child's ability to learn to read is greater at three years of age than when he is older. In planning the curriculum of the pre-school it is important to know if these claims are true in order to put this type of stimulation into its proper perspective.

This study was proposed then, to determine if children who are three years old do exhibit more ability to learn to read words than children who are older. It would also compare the abilities of boys and girls.

Thirty children from the Child Development Laboratory at Utah State University were selected on the basis of age and sex for this study. Fourteen were the youngest three-year-old children, seven girls and seven boys. Sixteen were the oldest four-year-old children, seven girls and nine boys. In groups of three the children were presented with eight words during four teaching sessions, four words were taught in

the first two sessions and four words were taught in the last two sessions. The words were printed in large lower case letters on five by eight cards. Each child was given similar cards with the words printed on them to keep.

Following the teaching sessions a test was given by having each child read the eight words individually. Two weeks later a similar test was given for retention.

Two hypotheses were tested:

1. Three-year-old children will learn to read more readily than children who are nearer five years old.

2. Girls will be able to read the eight individual words used in the study better than the boys. Neither of these was confirmed. The findings suggest that the differences in reading abilities of three and four-year-old children and between boys and girls of this age range are too small to be significant.

Conclusions

From the findings of this study it may be concluded that age and sex differences in ability to learn to read words appear to develop at a later age than three or four years. It appears, however, that learning to read words is not beyond the capabilities of three and four-year-old children.

Recommendations for Further Study

Since the results of this study did not indicate at which age children exhibit the greatest ability to read, a similar study could be done using children both younger and older than the laboratory children. Also, the children in the Child Development Laboratory would fit this description by Hughes (1956, p. 464), "...children from homes where there are books and people who read them and who have been read to, and handled books themselves make a more rapid adaptation to reading ...", so a study of children from a lower social class might give different results. The object of such studies would not be to determine when formal reading activities should begin but to obtain a better understanding of the abilities of young children so that the activities of the pre-school can present the maximum amount of challenge to the child during that time.

Furth's (1970) belief that the primary purpose of the school is to develop the intellect and that reading should hold a secondary place needs to be kept in mind. Also, the informal and casual approach to reading of Durkin (1966) and Natches (1967) that are pressure free and natural are to be desired. But stimulating the child's interest early in life and exposing him to self-teaching materials when he shows he is interested may eliminate much of the failure and frustration we see in schools today. Being aware of the young child's ability to read emphasizes the importance of early stimulation.

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