

Reading Before Speaking

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It is generally believed children are not ready to read until about 5 years and that speech production is a necessary and desirable basis for a teaching methodology. In this study, a four-phase program—*Alphabet Familiarization; Alphabet Identification; Word, Phrase, & Sentence Identification; and Text Reading*—was administered to a subject, beginning at 6 months of age. Significant reading skills were acquired during the subject's pre-speech period. By 3½ years the subject read short sentences fluently, and by 8 years, his speed and accuracy equalled eleventh graders. A mongoloid child administered the program at a later age now (at 5 years) reads 48 words and 5 phrases and sentences. It is concluded that most current notions on reading readiness and on the role of speech production in teaching methodology require reconsideration.

This paper is concerned with the question of when and how a child should be taught to read. The linguist Leonard Bloomfield (1961) expressed the view of reading held today by most people, lay and professional, when he stated:

In order to read alphabetic writing one must have an ingrained habit of producing the phonemes of one's language when one sees the written marks which conventionally represent these phonemes. A well-trained reader, of course, for the most part reads silently, but we shall do better for the present to ignore this fact, as we know the child learns first to read aloud. . . . *Alphabetic writing merely directs the reader to produce certain speech sounds. A person who cannot produce these sounds cannot get the message of a piece of alphabetic writing.* If a child has not learned to utter the speech sounds of our language, the only sensible course is to postpone reading until he has learned to speak. (p. 26-7, our italics.)

A view similar to Bloomfield's is held by the language philosopher, Ryle (1949), who has stated that,

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. . . talking to oneself in silence is acquired neither quickly nor without effort; and it is a necessary condition of our acquiring it that we should have previously learned to talk intelligently aloud and have heard and understood other people doing so. . . . Similarly, *a boy has to learn to read aloud before he learns to read under his breath*, and to prattle aloud before he prattles to himself. (p. 27, our italics.)

Thus, it is advocated that the teaching of reading must wait until the child has gained relatively complete mastery of his language, both in production and understanding. The child is taught to read aloud, and then silently. Although such assumptions regarding the nature and teaching of reading are prevalent, no empirical research actually has been provided which could be said to establish these theses (see Durkin, 1968, for a survey of literature on early reading).

The possibility that such views could well be false, occurs to us because of two propositions which we hold valid: (1) the essence of the reading process is the acquiring of meaning*or understanding through the medium of visual materials (i.e., orthography) and (2) language understanding on the part of children learning a language always precedes language production (i.e., speech production lags behind). We reason that if children can understand speech to some extent even though they cannot produce it, then, why could they not be taught to recognize the orthographic representations of that speech? Such a conception reverses the accepted learning procedure by teaching the child to read silently before he learns to read aloud.

The investigation which we report here concerns our efforts to teach a young child to read in just this fashion. The administration of our reading program began when the subject (*S*) was 6 months of age. At this age the *S* could not speak but could understand some words spoken to him.

Method

Subject & Experimenters. The *S*, whose name is Kimio (hereafter *K*), was born in January, 1964. An only child, he appeared bright and alert and his physical development was normal. His speech development was perhaps a little below normal in his early years.

At 12 months he could say only four distinguishable words and at 24 months only about 25 single words and a couple of two-word utterances could be produced. At about 30 months, however, he began to acquire advanced structures and vocabulary quite rapidly so that by his third year his speech production ability was somewhat above normal.

The experimenters (*Es*) are *K*'s parents, and the authors of this paper. Both are university lecturers with a professional interest in language. They designed the reading program (outlined below) which they began to administer to *K* when he was 6 months. The program was terminated about 4 years later by which time the essential goals had been achieved.

K's *Language Environment*. *K* was raised in a mainly English-speaking environment. Occasionally, Japanese was spoken by his mother and other Japanese speakers, particularly his uncle who was a member of the same household during *K*'s 1 to 2 years.

K was introduced to books early in life. He was given books of cloth or plastic to play with as early as 6 months. The *Es* would stimulate *K*'s interest in such books, which for the most part consisted of pictures, by looking through the book with him and commenting on the pictures. Later when *K* appeared to understand language, they began to read to him regularly, usually at bedtime. Like most children, *K* enjoyed having books read to him.

When possible, the *Es* exploited the appearance of letters in the natural environment. Letters which appeared on television, in newspapers and magazines, on labels and boxes, and on signs were drawn to *K*'s attention and named. Since such occurrences in the world at large never failed to excite *K*, he was only too happy to point in response to a question like "Where is Ay?" *K* was similarly delighted to have a set of plastic letters (with magnetic backs) and letter blocks to play with.

The *Es* also initiated library visits to provide a source of stimulation and encouragement for *K*. *K* was started at the library when he was 32 months. Going to the library and taking out books became a regular weekly activity.

Procedure. The reading program is divided into four procedural phases: (1) *Alphabet Familiarization*, (2) *Alphabet Identification*, (3) *Word, Phrase, and Sentence Identification*, and (4) *Text Reading*. It cannot be overemphasized that throughout the program the *Es* attempted to foster a positive attitude towards reading and learning to read on the part of *K*. Learning sessions were approached as games and not serious lessons. Sessions were generally brief, just a minute or two in length. They were conducted anywhere (bedroom, bathroom, or kitchen), any time (night or day), and under any condition; e.g., while *K* was walking or having his diapers changed. An activity was discontinued whenever *K*'s attention began to wander or it looked as though he might soon begin to tire of it. Encouragement and praise were never spared.

Phase 1: Alphabet Familiarization. The purpose of this phase was to familiarize *K* with the shapes of letters. Familiarization is intended to establish a perceptual basis for distinguishing among the variety of visual shapes which letters exhibit. This would prepare *K* for the next phase where he would have to learn to discriminate individual letters from one another.

The phase was initiated during *K*'s sixth month, at which time he could sit with support, could recognize familiar faces, and understand the names of some familiar objects. Since only familiarization is the goal, having even this minimal degree of language (understanding names) might not be considered a necessary prerequisite to initiating this phase. *K* could not speak, nor was it necessary for him to be able to.

The upper-case letters, 2 inches in height, were printed in red with a felt-tipped pen on two strips of white paper (3 inches x 24 inches) and taped inside the footboard of *K*'s crib. The lower-case letters were printed on similar strips of paper and taped to the headboard of the crib. The lower-case letters were 1 inch (for a, c, m, etc.) or 1½ inches (for b, t, j, etc.) in height. The style of print which is prevalent in most children's books is the one which was used. Thus, the lower-case of the first letter of the alphabet was printed as 'a' and not 'ɑ'. Similarly, the lower-case of G was printed as 'g' and not 'ǧ'. All letters were positioned along a pencil line in order that the orientation of the letters with respect to a base line would be apparent.

Because *K* would tear and lick the letter strips, it became necessary to tape the strips securely to the crib and cover them with transparent tape. In all, the strips had to be replaced three or four times because of wear. Following the first replacement, all letters were printed in black instead of red. Since black is typically the color of type, it was thought that familiarity with letters of this color might be helpful. The format of the strips was also changed; upper- and lower-case forms of the same letter were printed next to each other on the same strip (A a B b C c, etc.). In this way, the differences between upper- and lower-case letters were highlighted. This format was retained throughout this phase and the succeeding phase.

Several times a day the *Es* would point to various letters and pronounce the (usual) names of these letters (“Ay,” “Dee,” “Ex,” etc.). This was done in order to direct *K*’s attention to particular letters. The *Es* attempted to select and name letters at random to avoid favoring certain letters and letter sequences. Letter names were used only for purposes relating to identification; i.e., to help teach *K* visually to discriminate letters and to test this differentiation. Purposely, no attempt was made to teach *K* the various sound correspondences of individual letters. Such an endeavor was viewed as an unnecessary complication and an impediment to learning to read. It was expected that *K* would induce sound correspondences on his own relatively effortlessly as his reading repertoire increased.

To further draw attention to each letter and also to teach *K* to point (a skill used in the next phase), *K*’s finger was sometimes held and pointed to a letter as it was named. Sessions usually lasted from two to five minutes, and generally totalled no more than ten minutes per day.

Phase 2: Alphabet Identification. In the second phase *K* was to learn to discriminate letters visually. Since the acquisition of this knowledge was to be tested by having *K* point (with fist or fingers) to letters which were named, *K* was considered ready to begin this phase when he could point to an object in response to hearing its name. *K* was in his eighth month when he was considered ready. At that time he could consistently point or look toward his father in response to “Where’s Daddy?” or touch his stuffed clown in response to “Where’s Mister Clown?”

Sessions of the second phase generally proceeded as follows: the *Es* would ask a question such as "Where is Vee [V]?" and then help *K* to respond by pointing his finger to the letter, saying, "Here is Vee." Then they would repeat the question and pause to let *K* point to the letter. Whenever he gave a correct response, he would be rewarded as much as possible with words and actions such as "Perfect!", "Right!", or a smile or a hug. While at first *K* required assistance in making the pointing response, later he was able to make the response on his own. When he made mistakes in pointing, as he frequently did at first, the *Es* would take his finger and point it at the correct letter. Eventually *K* learned to point to letters simply on the basis of their names, without first having the *Es* point them out. Each session, of which there were generally 4 or 5 per day, lasted 3 to 5 minutes. A total of 20 minutes per day was rarely exceeded.

Phase 3: Word, Phrase and Sentence Identification. The aim of this third and most critical phase was to teach *K* to identify the orthographic representation of words, phrases, and sentences. If *K* could *understand* the meaning of a word, phrase, or sentence that was spoken to him, he was considered ready to learn to read it; i.e., to identify the orthographic form of those items.

At 10 months *K* showed that he understood several words and phrases; e.g., he reacted to "Shall we go bye-bye?" by rushing to the door, and when he heard "No, Kimio" he would stop what he was doing. There were several objects which he could identify by pointing to them in response to questions of the form "Where is _____?" Consequently, *K* was considered ready to begin learning to read those words, phrases, and sentences which he understood. It should be emphasized that it was *not* considered necessary for *K* to be able to say these items in order to learn to read them.

The crucial aspect of this phase involves the learning of the first word. Until now *K* has learned that certain speech sounds are used to refer to certain objects in the environment; e.g., that the speech sound "boy" and the object 'boy' are associated, and that the speech sound "Ay" and the visual object 'A' are associated. What must be learned next is that certain combinations of letters are used to represent certain words of the language and their meanings.

In order to suggest a close relationship between object and printed word and to set up a situation for teaching, several pictures (four of *K*'s favorites) were fixed to the walls of *K*'s bedroom, each with a word printed beneath. The words for these pictures were *baby*, *car*, *boy*, and *girl*. The *Es* would look at and talk about the pictures with *K* several times a day in order to stimulate his interest in them.

The *Es* trained *K* to point either to the picture or to the written word whenever the word was spoken. (The procedure was similar to that used in the previous phase.) Once this sort of response was established, the picture was removed (permanently) and only the printed word was retained on a card. *K* learned to point to this printed word when he heard the word spoken. In this way, the word *boy* was focused on and became the first word that he learned. After this word was learned, the other items on the wall—*car*, *baby*, and *girl*—were reduced to their printed forms only and similarly learned. From this time on, any new item was presented only in a printed form. No pictures or objects were presented with the printed form nor was there any necessity to do so. The *Es* simply saying the word and pointing to its printed form was sufficient. Once *K* had acquired the critical idea that a printed form represents a word, association with the original objects evidently was no longer necessary.

In order to orient *K* properly for interpreting English orthography, the *Es* would run their index finger across the printed word from left to right when reading. *K* was encouraged to imitate this pointing. Soon *K* would move his eyes in a left to right direction whenever he looked at words.

The *Es* printed each word, phrase, or sentence on a card. The cards were made of cardboard and the letters were of the same size and character as in the previous phases. A card was 3 inches wide and 7 or more inches long depending on the length of the words involved. So that the words would be similar to those found in books, capitalization was only used for proper names and the beginning of sentences.

New cards were made to commemorate any new experience of *K*'s. A pack of blank cards was always kept handy. *K* would make it known whenever he himself wanted a new card made. The basic

principle underlying the making of cards was simply that no card be made unless the words on it were ones that *K* would understand if they were spoken to him. In this way, the teaching of reading was not made more complex by the teaching of language.

Because words like *the* and *to* are not meaningful in isolation, such types of words (articles, prepositions, etc.) were never placed alone on a card. However, these sorts of words were included on cards having phrases and sentences when it appeared that *K* understood the meaning of the phrase or sentence as a whole. Phrases and sentences, it should be noted, were always spoken with natural speed and intonation. They were never spoken in a stilted word-by-word fashion. This was done so as to encourage *K* to focus on the meaning of the larger reading unit.

Once cards were made for items, the cards themselves were used for teaching and testing. *K* would be asked to pick out a particular card; e.g., "Where does it say helicopter?" and would be rewarded if he picked the right card. He was encouraged to make a different choice if he picked the wrong card.

When *K* began to speak and was able to say the words on the cards, he was not discouraged from doing so. Sometimes, the *Es* would hold up cards and ask *K* to verbally identify them. *K* enjoyed any such variation.

A reading session with the cards would last anywhere from 2 to 15 minutes depending on *K*'s interest. In general, less than 15 minutes per day were spent in reading sessions during this phase.

Phase 4: Text Reading. The purpose of this final phase was to teach *K* to read the text of books. Instead of simply reading single isolated sentences, *K* had to learn to read sequences of two or more sentences which are related in some meaningful way.

For purely practical reasons the *Es* waited until *K* gained fluency in speech and was able to read aloud before beginning this phase. Reading aloud provides a simple means of monitoring reading progress, especially with respect to determining particular areas of difficulty.

K was 33 months when this phase was seriously initiated. The *Es* made cards for many of the words, phrases, or sentences which appeared in *K*'s favorite books. By making such cards, the *Es* wished to familiarize *K* with some of the items in a book before

attempting to teach him to read it in text form. As *K* began to read books, however, card making became unnecessary since the books themselves contained a permanent record of the items to be read. Nonetheless, practice and testing with the large stack of cards which were already made was continued for some time afterwards because *K* enjoyed working with them.

The books selected for use were always within *K*'s level of comprehension, vocabulary, and structure range. Most importantly, the subject matter of the books had to be inherently interesting to *K*. Without such an interest, the *Es* feared that reading would become a burdensome chore and engender an aversion to learning to read.

The relationship of pictures to text varied greatly in the books which were given to *K*, the amount of text increasing with age. *K*'s earliest books at about 6 months consisted of pictures only and no text. Most of these were made of cloth because paper was too easy to destroy. At 12 months *K* was given books with pictures on every page and with a single word, phrase, or sentence under each picture. A number were novelty books of different shapes from a series called *A Golden Shape Book* published by Golden Books. By 20 months *K* was given books which had a picture on each page along with a sentence or two. There was no plot or story connecting the various pictures. Books of this type were *Everything Happens to Aaron*, *Hop on Pop*, and *Silly Billy's Alphabet*. At about 26 months *K* was given books which had a picture on almost every page but had 2 to 10 sentences of text per page. Furthermore, the text of each page was connected to form a story. Most of these books are from the Random House Beginner Book Series. Because pictures may serve to motivate reading by providing esthetic satisfaction and by stirring the imagination, *K*'s books always contained an abundance of pictures.

In general, to introduce a new book, the *Es* would first read the entire text aloud to *K*, commenting on the story and asking questions about it in order to increase his interest in it. They usually pointed as they read. Then they would go back through the book reading one line or sentence at a time, allowing *K* to repeat what they had just read. *K* would then be asked to read some of these sentences without prior prompting being given. He was praised

when an item was read correctly. When an item was read incorrectly, the *Es* would encourage him to try again. If he still did not produce the correct item, they would provide the answer and ask *K* to repeat the corrected item. *K* was also praised for a correct repetition. He soon developed the habit of repeating corrected items without being asked to do so. *K* would go through a book with the *Es* in this way, until he was ready to read it by himself. When this time came, the *Es* would provide help on difficult words and phrases. To make sure *K* could read independently and was not just reciting from memory, occasionally the *Es* would point to lines in the text at random and ask what was written.

When, by the age of four, *K* was often able to read new books on his own without prior help, the *E*'s role changed from that of active teaching to one of passive supporting. Since in the *Es*' estimation it was mainly practice that *K* now needed, less assistance and more encouragement were provided.

Tests and Evaluations. *K*'s reading performance was formally assessed on three occasions, when he was 3 years 6 months, 4 years 11 months, and 7 years 11 months.

On the first occasion the *Es* made a tape recording of *K* reading a book he had not seen before. The book, *Snow* by McKie and Eastman, is a Random House Beginner Book, 60 pages long (495 words running), and with a vocabulary of 139 different words. The text dealt with some subject matter which was unfamiliar to *K*, such as making snowballs and snowmen, skiing, and sleigh riding. The reading procedure employed during the taping was not typical, since *K* had never before been asked to read an entire new book by himself. As *K* read, the *Es* corrected him when he was wrong, rewarded him often with praise, and encouraged him to read to the end. The supervisor of the Reading Center at the University of Illinois, Colin Dunkeld, analyzed the tape.

On the second occasion, *K*'s reading ability was again evaluated by Dunkeld at the University of Illinois Reading Center. Standardized reading tests, however, were administered (by Dunkeld) this time. The tests were: (1) *Informal Reading Inventory*: Form B, University of Illinois; (2) the *Queen's College Graded Word List*; (3) *Gates-MacGinitie Reading Tests*: Primary A, Form 1 Compre-

hension and Primary B, Form 1 Vocabulary and Comprehension; and (4) *Wide Range Achievement Test*: Reading Level 1.

K's reading ability was evaluated for the third time at the Reading Center, University of Hawaii, again by means of standardized reading tests. The tests administered were: (1) the *Gates-McKillop Reading Diagnostic Tests*: Form 1; (2) *Gray ORAL Reading Test*, Form A; (3) *Dolch Basic Sight Vocabulary Test* (220 words); and (4) *Gates-MacGinitie Reading Tests*: Survey D, Form 1, and Survey E, Form 1.

Results

Letters. During the first phase, *K* became very familiar with the letters taped to his crib. The letters came to attract and interest him so that he often played with them as toys. He would frequently look at them, reach out for them, touch them, and when his feet were close enough, kick them. The letter naming routine also captured *K*'s interest. During a diaper change, a letter naming session had the effect of keeping him still.

By the age of 16 months *K* could identify most of the lower-case letters. Unfortunately, because he was not tested on letters until several months later, at what age he mastered the entire alphabet is not known. However, at the age of 21 months when he was tested, *K* was able to correctly identify all of the upper- and lower-case letters by pointing to each as it was named. (The third phase was already well underway by this time.)

Words, Phrases & Sentences. At 12 months *K* could identify the cards for the words *boy*, *car*, *baby*, and *girl* by selecting a particular card from the set of four when asked to do so. He could not say any of these words. By 24 months *K* could identify 48 words, phrases, and sentences. Of these, he was able to pronounce (or approximate in a way the *Es* could understand) only 15. When *K* began to develop speech rapidly, after his 24th month, there was a great increase in the number of new cards. For example, 52 were made during his 26th month. By his 30th month, *K* could read 181 different items. Table I lists these items.

The ages listed in Table I indicate *K*'s age at the time the card was made. It is not necessarily the age when *K* learned the item,

TABLE I. *K*'s Reading Items*Age when card made (in months) with item.*

10 boy	15 Miho ¹	24 hot	26 meat
10 girl	15 orange	25 bicycle	26 more
11 baby	15 apple	25 Mama's key	26 papaya ³
11 car	16 airplane	25 moon	26 no more
12 key	16 book	25 pear	26 shee shee ⁴
12 Daddy	16 drive	25 truck	26 water
12 down	17 bag	25 nine	26 yes
12 blow	17 come on	25 bus	26 bacon
12 cake	18 corn	25 blanket	26 meadow gold ⁵
13 bed	18 fork	25 stop	26 sleep
13 birdie	18 What's that?	25 helicopter	26 spoon
13 bottle	19 table	25 Auntie	26 thank you
13 bye	20 I didn't	25 ice cream	26 TV
13 cookie	20 walk	25 cup	26 bike
13 Kimi	20 I see	25 teeth	26 boat
13 no	21 mine	25 coffee	26 clock
13 shoes	21 money	25 choo-choo	26 sunny
14 banana	22 Grandpa	train	26 seal
14 ball	22 muumuu ²	25 9 o'clock	26 salt
14 go	23 cold	25 Shut the door	26 toast
14 grass	23 Jim	25 Daddy's key	26 eye
14 hooray	23 Peter	26 dog	26 hop
14 mama	23 Peter's room	26 drive the car	26 Indian
14 milk	24 diaper	26 door	26 Mickey
15 tea	24 card	26 juice	26 towel

Note: Each month indicates a range in age from .0 to .9. Thus an entry of 10 months, for example, indicates an age range of from 10.0 months to 10.9 months.

1. The name of *K*'s mother.
2. A Hawaiian dress.
3. A Hawaiian fruit.
4. Urine (Japanese).
5. Name of brand of milk.
6. Name of a little girl.
7. Name of a clown doll.
8. Name of a little boy.
9. Name of a shopping center.

26 okay	26 cook	28 shirt	29 Aunt Alice
26 please	26 sick	28 Kathy	29 sit down
26 buckle my shoe	26 Mr. Clown ⁷	28 change	29 push the
26 record	27 other room	28 How about	button
26 Open the door	27 school bus	that?	30 fish
26 Tony	27 stocking	28 dirty	30 bubble
26 balloon	27 chair	28 tissue	30 baseball
26 candy	27 red light	28 Ala Moana ⁹	30 bathroom
26 Danny	27 green light	28 up and down	30 feed the
26 elevator	27 jump	28 two	animals
26 watch	27 Kimi's room	28 Dean	30 grapes
26 What's this?	27 rice	28 newspaper	30 one by one
26 egg	27 rain	29 bat	30 sandbox
26 fire	27 harmonica	29 haircut	30 yellow bus
26 hat	27 pants	29 Japan	30 puzzle
26 horse	27 Shin-chan ⁸	29 Owen	30 Batman
26 monkey	27 write	29 pail	30 What is new?
26 Mila ⁶	27 guava juice	29 pen	30 Uncle Arthur
26 mail	27 not now	29 Ryan	30 merry-go-round
26 mouth	28 Waikiki	29 hit the ball	30 sing a song
26 apple juice	Beach	29 lie down	
26 Don	28 Steinberg	29 Uncle Ernie	

since the amount of time and the number of presentations required to learn individual items varied. However, since all items were learned within a month of the first presentation, the age of card-making plus one month would cover the age by which the item had been learned. Such an estimate is a conservative one since *K* learned many items after a single presentation.

Of the 181 items *K* had learned by his 31st month, 136 are single words, 28 are phrases, and 17 are sentences. Words range in length from 2 letters (*no*) to 10 (*helicopter*). *K* did not appear to have any more difficulty learning longer words than he had learning shorter ones. *Airplane* (8 letters) and *Grandpa* (7 letters), for example, are among the earliest words he learned and these were learned after only one trial. A few of the early phrases and sentences *K* learned to identify may or may not have been regarded by him as actual phrases or sentences in the beginning. *What's*

this? or *ice cream*, for example, may well have been viewed as a single word. Of the single words *K* learned, most (109) are nouns. The others are mainly verbs (11) and adjectives (8). The majority of phrases are adjective/noun combinations (10); e.g., *red light*, *other room*. Of the 17 sentences, 11 are imperatives; e.g., *hit the ball*, *lie down*, 4 are questions and 2 are statements. All items were ones whose meaning *K* demonstrated that he understood.

K learned to read a number of words before he had completely mastered all of the letters of the alphabet. Among these were the words *boy* and *key*. Although *boy* was learned separately a couple of months earlier, *K* frequently mistook one word for the other. However, once he had learned all of the letters of the alphabet, he no longer confused the two.

Sound Correspondences. Despite the fact that *K* had not been taught the sound correspondence of letters by the *Es*, during his 27th month it became apparent that he knew the sound value of some letters. On one occasion, just after his mother had printed up several new cards and had not yet identified them for *K*, *K* picked up the one on which *clock* was written, and said, “k-k-k—What’s this, Mommy?” Since *K* already had 10 words on cards that began with the letter *c*, (all but one having a [k] pronunciation) it appears that he induced the proper sound correspondence principle from such data. A similar situation occurred with the letter *t*. He said “t-t-t” for the newly written word *toast* before it was pronounced or identified for him. By the time *K* was 4 years old, he had become adept at reading new words aloud in a style which was smooth and fluent. *K* generally did not use a sound out letter-by-letter approach to the pronunciation of novel items. (See the results of the first evaluation session below for more data with regard to this question.)

Text. By his 27th month *K* could read a few simple books aloud. Among these were those in the Beginner Book series: Dr. Seuss’s *Hop on Pop*; *One Fish, Two Fish, Red Fish, Blue Fish*; and *Green Eggs and Ham*. By the time *K* was 3 years 7 months old, he could, at first sight, read correctly about two-thirds or three-quarters of a book of this type.

Although *K*’s card learning had mainly involved silent reading,

his book learning involved reading aloud. As a result, he could not read books silently. In order to get him out of the habit of reading aloud, the *Es* encouraged him to read short passages silently, issuing reminders to read silently when *K* would read aloud. After a couple of months, by the age of 4 years 4 months, *K* was able to read silently.

Evaluation 1: Age 3 years 6 months. Excerpts from the transcript of *K*'s taped responses to each line of the text of the book *Snow* is shown in Table II. Although *K* went through the entire 135 lines of the book, due to space limitations only a sample of his responses is presented.

Analysis shows that *K* was able to read about 50 of the 135 lines of text perfectly at first sight; e.g., *Come out in the snow*, *What is snow? We do not know*, *We can't go fast*, and *Just look at the snow*. The sentences and phrases are pronounced fluently and with appropriate intonation. Unnatural pauses do not occur. His verbal expression indicates that he understands the sentences.

For those sentences he had to labor through word by word, he would often say the entire sentence over again when he completed the process. *K*'s natural manner and intonation in such recapitulations indicate that he understands what he is reading.

The mistakes *K* made are quite revealing. Most of his mistakes are substitutions of unknown words. There seem to be two kinds of substitutions: one of meaning (e.g., *Come up* for *Get up*; *The hill is deep* for *The hill is steep*) and one of orthography (e.g., *a big apple* for *a big appetite*; *He has to have a bread* for *He has to have a head*). When *K* came across a word he did not know, he usually tried to guess what the word was. Sometimes he simply asked what it said. When he tried to read words he did not know, he generally attempted to read them as wholes, and gave little evidence of analyzing parts of words. For example, he attempted *sid* for *slide* and *louts* for *let's*.

Evaluation 2: Age 4 years 11 months. These results are perhaps best presented in the words of the original report:

The Informal Reading Inventory is a series of reading passages taken from basal readers at each reading level. The child reads aloud and answers prepared questions. Kimio's performance:

TABLE II. Excerpt from Transcript of *K* Reading Text

Lines of the text of the book, *Snow*, are numbered and shown in regular type. *K*'s responses (in italics) are presented only when he has made some sort of error. Thus, if no response of *K*'s is shown following a line of text, this indicates that the line was read perfectly by him at the first try. The responses of *D* (Daddy) also appear (in italics).

1 Snow!	<i>K</i> : to make
2 Snow! Snow!	<i>D</i> : It
3 Come out in the snow.	<i>K</i> : It make your sid.
4 Snow! Snow!	<i>D</i> : It makes you slide.
5 Just look at the snow!	<i>K</i> : slide.
6 Come out! Come out!	34 Snow is good
7 Come out in the snow.	35 For making tracks . . .
8 I want to know	<i>K</i> : For make ticks
9 If you like snow.	<i>D</i> : For making tracks.
<i>K</i> : If you like the—like snow.	<i>K</i> : t-r-acks.
10 Do you like it?	<i>D</i> : See, these things here are tracks.
11 Yes or no?	<i>You push the snow in—</i>
12 Oh yes! Oh yes!	<i>K</i> : What's tracks?
<i>K</i> : Oh yes! Oh—yes	<i>D</i> : Tracks are these things here that
<i>D</i> : Um-Hum.	<i>you push in.</i>
<i>K</i> : Oh yes! Oh yes!	<i>K</i> : Push, push, push?
13 I do like snow.	<i>D</i> : Yeah.
<i>K</i> : I do—I do—like snow.	<i>K</i> : Why?
<i>D</i> : Perfect! So far, perfect!	<i>D</i> : Well, you do that with the snow.
14 Do you like it	<i>You'll see.</i>
15 In your face?	39 The snow is deep.
26 Snow is good.	<i>K</i> : The snow is drop
27 For me and you,	<i>D</i> : The snow is deep.
28 For men and women	<i>K</i> : deep.
<i>K</i> : For men—what is—and—what	<i>D</i> : That means it's very thick—
<i>does that say?</i>	<i>very deep.</i>
<i>D</i> : For men and women	40 We can't go fast.
<i>K</i> : Women.	41 The hill is steep.
29 Horses, too.	<i>K</i> : The hill is deep.
30 Snow is good.	<i>D</i> : The hill is steep.
31 It makes you slide.	<i>K</i> : steep
<i>K</i> : We make	66 A lot of snow balls
<i>D</i> : It	<i>K</i> : A lot of—of snow balls.

- 67 Make a wall.
 68 Put on more snowballs
 69 One by one.
 70 Our house of snow
 71 Will soon be done.
K: *Will stand*
D: *Will soon*
K: *be down*
D: *done.*
K: *done.*
 72 Do you like bread?
K: *Do you like bread. Bread?*
D: *Bread—that's right.*
 73 Do you like meat?
K: *Do you like must?*
D: *No, meat.*
K: *Meat.*
 74 Come in our house.
 75 Come in and eat.
 76 Snow is lots of fun,
K: *Snow is—What does that say?*
D: *is lots*
K: *of fun.*
 78 It gives you
K: *It goes*
D: *No, first of all, that word is . . .*
K: *It—What does that say?*
D: *gives*
K: *gives you*
 79 A big appetite
K: *A big apple*
D: *No, appetite.*
K: *appetite.*
 80 We had our bread.
 81 We had our meat.
 82 Some bread is left
K: *Snow bread*
- D*: *No.*
K: *Some bread*
D: *Right.*
K: *is . . . is—What does that say?*
D: *is left.*
K: *left.*
 98 But first
K: *But fish . . . first*
 99 He [the snowman] has to have a
 head.
K: *He has to have a bread*
D: *A what?*
K: *a bread.*
D: *a head.*
K: *a head*
 120 The way that sun
K: *The way the—the way that sun*
 121 Is coming down,
K: *is . . . is come*
D: *is . . .*
K: *is ca-ing*
D: *You know, you almost had it.*
K: *going, coming.*
D: *coming. Right*
K: *down.*
 126 Take all you can
 127 And run! Run! Run!
 128 The snow out there
 129 Will come and go,
 130 But snow will keep
 131 In here, we know.
 132 So we will put
K: *So we will pail.*
D: *No, put.*
K: *put*
 133 This snow away.

	Grade 2	Grade 3	Grade 4	Grade 5
WORD RECOGNITION	91%	96%	94%	84%
COMPREHENSION	84%	33%	41%	12%

The majority of Kimio's errors were omissions and substitutions. Most of the words he omitted carried little information. Once again he proceeded rapidly. When he encounters an unfamiliar word he usually makes a quick attack which preserves some features of the word. He gives evidence of recognizing word parts of syllable length in unknown words. He gave no indication of using any letter sounding technique on this test. His errors suggest that he is paying attention to meaning and making use of clues provided by the context. For example, he read *let me* in place of *let's*, *it* in place of *a piece*, and *outloud* in place of *aloud*. On multi-syllabic words he manufactured novel forms by making syllable substitutions in the middle of words. For example, he read *rescovered* for *received* and *inspentions* for *inspectors*.

The rapid drop in comprehension after the second-grade level is more probably a function of the subject matter of the reading passages than an indication of Kimio's general approach to reading. He is able to pronounce many words that he does not yet know.

Queen's College Graded Word List. Kimio read all of the words at pre-primer, primer, first- and second-grade levels without error. At the third- and fourth-grade level he missed seven of the ten words. He pronounced one or more syllables correctly on all of the words he missed at levels four and five. He read quickly and with little hesitation. Quite often in the multi-syllabic words he substituted one English syllable for another in the middle of the word thereby manufacturing novel forms of his own.

Gates-MacGinitie Form B.

Vocabulary: Grade level 3.6 Comprehension: Grade level 2.5

Gates-MacGinitie Form A.

Comprehension: Grade level 3.6

Wide-Range Achievement Test. A graded test of word pronunciation. Score: Grade level 4.1

Evaluation 3: Age 7 years 11 months. The following is quoted directly from the University of Hawaii Reading Center report:

Gates-McKillop Reading Diagnostic Tests, Form 1 (Grade Scores reported).

Oral Reading: 6.0 Words Flash Presentation: 6.6

Words Untimed: 6.2 Phrases Flash Presentation: 5.4 (Perfect Score)

Knowledge of Word Parts: 6.9 (Perfect) Auditory Blending: 4.9 (Perfect)

Recognizing Visual Form of Sound: 5.9 (Perfect)

Spelling: 4.4 Oral Vocabulary: 6.8 Syllabication: 5.6

On the oral reading test *K* read fluently in paragraphs 1-5, and his expression and phrasing were excellent.

Gray ORAL Reading Test, Form A. Grade Score: 6.5

Analysis. *K* read enthusiastically with excellent expression and phrasing. Most of the mispronunciations resulted from a difficulty with the middle syllable in a multisyllabic word.

Dolch Basic Sight Vocabulary Test (220 words).

Read 220 words Missed 0 words

Gates MacGinitie Reading Tests, Survey D Form 1.

	<i>Speed & Accuracy</i>		<i>Vocabulary</i>	<i>Comprehension</i>
	<i>No. Attempted</i>	<i>No. Correct</i>		
PERCENTILE	99	99	86	96
GRADE	11.8	12.0	6.0	8.1

Gates MacGinitie Reading Tests, Survey E, Form 1.

	<i>Speed & Accuracy</i>		<i>Vocabulary</i>	<i>Comprehension</i>
	<i>No. Attempted</i>	<i>No. Correct</i>		
PERCENTILE	93	93	31	38
GRADE	12.3	9.8	5.9	6.3

In summary, this final evaluation shows that on most tests of oral and silent reading, *K*'s reading performance at the age of 7:11 was at least equivalent to the average performance of children in the middle of their sixth grade year; i.e., age 11:6. *K* ranks in the 99th percentile among students in grade 4, and the 93rd percentile among students in grade 7. His performance on tests of reading speed and accuracy is at least the equivalent of the average performance of students in the middle of their eleventh grade year. *K* was in the third grade at the time the tests were administered.

Discussion

Success of the Reading Program. By 3½ years of age *K* was able to read short sentences fluently and with natural intonation; new words could often be read at first sight. By 5 years he was reading at grade 3 level and beyond. Since *K* had not been taught reading at school, such findings may be plausibly attributed to the effects of the program.

On the other hand, the later findings—that by 8 years and as a third grader, *K*'s reading achievement equalled or bettered: (1) sixth graders on vocabulary and comprehension, and (2) eleventh graders on speed and accuracy—have, of course, been influenced by schooling. However, since there was nothing special about the reading instruction which *K* received at school, we are inclined to attribute his high level of achievement, in large part, to the influence of the early reading program.

K's eleventh-grade level in speed and accuracy, in particular, lends credence to that interpretation. We feel that the emphasis of the program on the understanding of written material, as opposed to the pronunciation of that material, resulted in *K* becoming what might be called a *visual* type of reader. Such a reader typically directly associates orthographic configurations with meaning without the mediation of any other process—such as speech production—either overt or cognitive.

Speech Production and Teaching Methodology. Unfortunately, most reading programs—from the “linguistic” (Structuralist; e.g., Bloomfield, 1961) to the “phonic” (e.g., Heilman, 1968)—involve a methodology which assigns a primary role to speech production in the teaching of reading. Essentially, the Bloomfieldian approach focuses on the pronunciation of words, while the various phonics approaches focus on the pronunciation of individual sound segments or syllables. The assumption underlying such methodologies—that speech production is necessary for the learning of reading—however, is ill-founded. This study shows that the teaching of reading does not require prior speaking ability on the part of the learner.

This study further shows that the sound correspondence of letters can be learned through simple induction without the need of special training or materials. Correspondences were learned by

K incidentally during the course of learning to identify whole words. Such a feat on the part of a child should not be surprising when one considers that such learning is not nearly so complex as what the child learns at the same age in terms of the sound patterning of his language. The sound pattern of the language is acquired virtually entirely through induction, on the basis of spoken whole words. Parents do not, for example, talk in individual sound segments or syllables to their infants before they say whole words, nor do they usually attempt to verbalize phonological rules for them. Yet, children do learn the phonology of their language. Such being the case, we might then expect that children would acquire the sound correspondences of letters, too, in the course of learning to read whole words.

Early Reading and Programs. The present investigation demonstrates that the teaching of reading may begin as early as 6 months of age and that during the pre-speech period significant reading skills may be acquired. By 1 year, for example, *K* could distinguish many letters and could identify four words although he could not say them. And, by 2 years he could identify 48 words and phrases even though he could articulate less than a third of that number.

On the basis of published literature of which we are aware, prior to this study, the youngest age at which a systematic reading program had been administered was 2 years. (Doman, 1964 & 1971; and Fowler, 1962). Both the Doman and Fowler programs use a whole word "look-say" type of approach.

The Fowler program was applied rather briefly (about 9 months) to a 2-year-old *S*. It involved rather limited objectives, focusing mainly on the reading of individual words. The *S* was reported to have "covered" 250 words during the course of the program.

The Doman program seems to have involved hundreds of *Ss* and with varying degrees of success. Unfortunately, perhaps because individuals were not studied intensively, Doman presents only anecdotal evidence (parent's letters, etc.) in support of the effectiveness of his program. Without any sort of quantitative data concerning the progress and achievement of his *Ss*, a comparison of the overall effectiveness of Doman's program and our own is not possible.

It might be worthwhile to point out a few of the more important ways in which Doman's program differs from our own:

1. Doman presents words before letters. Letters are taught only after a reading vocabulary of 60 words have been learned. It may well be that starting directly with whole words may be best. As noted above, the child will decompose wholes into parts anyway. On the other hand, a six-month-old child may respond better to less complex stimuli than do older children and thus may respond better to individual letters than to whole words. Fortunately, such an issue as this is one that lends itself to an empirical solution.
2. Doman prescribes a fixed set of vocabulary items to be learned, including such words as *of* and *the* (presumably because these two words are of high frequency). Even if most are common items, since environments and experiences vary considerably from child to child, it may well be that a number of these words may not be known by any particular child. Consequently, in such cases, the child would be required to learn the new word and read it at the same time. Such a double learning requirement presents an unnecessary obstacle to learning to read in our view. Learning language is not included in our program of learning to read since the child is asked to read only those words he already understands. And, too, because words like *of* and *the* are not particularly meaningful in isolation, we advocate their inclusion only in phrases and sentences.

General Applicability of the Reading Program. An objection may be raised to the generalizability of the findings of this study, to the effect that our reading program may have nothing special to recommend it because *K* might have learned to read as well as he did simply because he was a bright child. Although we can say that it is unlikely that even a bright child could have attained the degree of reading skill that *K* did and at the ages that *K* did without the benefit of the program, still, some reasonable doubt could, of course, remain. However, we do have other evidence which goes far to dispel any such doubt as to the effectiveness of the program.

Our reading program has been applied to *A*—a child with Down's Syndrome (Trisomy 21)—intermittently, over a period of about 34 months with significant success.¹ *A*'s parents began using

the reading program when he was 26 months. At 5 years 0 months of age, *A* can now read 53 different items, 5 of which are sentences and phrases; e.g., *cookie, ice cream, aeroplane, rabbit, duck, boy, girl, go, run, walk, sit, stop, Come Betty, Come Wayne, Go outside, See Susan, and Run Jimmy.* (See Kuntzman, forthcoming, for details of this case.)

These facts lend strong support to the notion that the program itself is an effective one. They further indicate that the program can be applied with some degree of success to retarded children. Given its feature of de-emphasizing the role of speech production on the part of the learner, it would appear that the program may be used as is or adapted to a wide variety of special groups in a population; e.g., mutes, second language learners, etc.

Early Reading and Reading Readiness. *K*'s reading achievements provide evidence (as does Doman's and Fowler's work to some degree) that contradicts most theories concerning when children are ready to begin learning to read. Because current theories and tests are really designed to measure what might be called "classroom readiness," it is not surprising that most children are not found to qualify before 5 years of age.

Consider the reading readiness prerequisites which are demanded by the Gates & MacGinitie (1968) *Readiness Skills* test, a test in wide use for kindergartners and first graders. The authors' description of each of its seven subtests follows, along with some of our comments:

[1] The Listening Comprehension subtest measures the child's ability to understand the total thought of a simple story. The subtest includes 20 stories (plus a sample story), each with a corresponding panel of three pictures in the test booklet. The examiner reads these stories aloud to the children. Each story is followed by a question, and the child is to mark the one picture in each panel that best answers the question. (p. 1)

Understanding and remembering the essentials of a story is required in subtest 1. Yet, *K* had acquired significant reading skills long before his being able to meet such a requirement.

[2] The Auditory Discrimination subtest measures the child's skill in distinguishing between two words of similar sound. It includes 21 pairs of pictures (plus one sample pair) that cor-

respond to 21 pairs of words. Each pair differs in only one sound. After naming both pictures in a pair, the examiner pronounces the name of one of the pictures again. The child marks the corresponding picture. (p. 1)

Many of the discriminations present in subtest 2 are not present in many varieties of English; e.g., *with-wit*. Since all items are presented in isolation without context, even standard English speakers might miss distinctions like *sub-sup* or *chip:ship*. In any case, ability to hear all distinctions is not necessary for reading so long as orthographic form and meaning are associated. After all, English spelling is not without irregularities, in which case, we as learners simply memorize the orthographic form. Certainly, *K* would not have been able to pass such a test until long after he had acquired significant reading skills.

[3] The Visual Discrimination subtest measures the child's ability to distinguish between the printed forms of two words. It includes 24 items (and a sample), each consisting of four words—three alike and one different. The child is to mark the one word that is different. (p. 1)

Such a subtest as 3 is not relevant to readiness but rather is part of the reading process itself. *K*'s normal vision at 6 months was all that was necessary in terms of visual discrimination ability.

[4] The Following Directions subtest measures the child's skill in following increasingly more complex directions. This subtest has 14 items (and a sample), consisting of one or more directions which the examiner reads aloud. Corresponding to each set of directions is a panel of four pictures to be marked by the child as he carries out the directions. (p. 1)

Consider a typical direction like, "Move your finger up to the next box, and put an X on the little dog that is followed by a big dog and another X on the big dog that stands between two little ones." The authors instruct the examiner,

Do *not* repeat the instructions for this or any of the following items in this subtest; read each direction clearly only *once*.

Pause after each item, but *do not pause between parts of the directions within an item*. (p. 9. Emphasis in original.)

Even *after K* had been reading fluently, it is doubtful whether he

could have responded to such instructions as in subtest 4. Such a criterion as this is an absurdly strong one.

[5] The Letter Recognition subtest is designed to measure the child's recognition of letters of the alphabet. It consists of 18 items (and a sample), with four letters of the alphabet in each item. The examiner names one letter which the child must recognize and mark. (p. 1)

Recognition of letters should not be used as a criterion of readiness, but should be incorporated into a program which teaches reading.

[6] The Visual-Motor Coordination subtest measures the child's skill in completing printed letters. Seven letters (plus a sample) are shown as models, and a part of each letter is also printed in the adjoining column. The child is to complete each letter in the adjoining column, following the model. (p. 1)

The physiological basis for the motor control demanded in subtest 6 typically does not mature in children until 5 or 6 years. *K* had great difficulty in forming letters until he was 6 years. (*K* continues to be a poor writer.) Writing is a separate skill entirely from reading and should not be used as a criterion for reading readiness.

[7] The Auditory Blending subtest provides information about the child's ability to join the parts of a word, presented orally, into a whole word. The 14 items (plus a sample) consist of three pictures each. The examiner pronounces the name of one of the pictures in each item, saying it in two or three parts, and the child marks the corresponding picture. (p. 2)

In subtest 7, the examiner is required to pronounce items similar to: *br-i-cks* (for *bricks*), *p-ai-nt* (for *paint*), and *n-ap* (for *nap*). The hyphen indicates where the examiner is to insert a one-second pause. The child is asked for example, "Put an **X** on *br-i-cks*." Because of the unnatural segmentation and the addition of other sounds (particularly vowels) in order to pronounce isolated consonants, even literate adults would find such items difficult to interpret. (See Bloomfield, 1961, for a criticism of "phonic" methodology.) Even at 5 years, when he could read fluently, it is doubtful that *K* could have passed such a test which distorts the natural language and expects testees to reconstruct the undistorted original item.

If the above test could be said to be atypical or unusual there might perhaps be little cause for alarm. Unfortunately such a test is all too typical of current readiness tests. See, for example, Hafner & Jolly's (1972) description of the widely used *Van Wagenen* and *Metropolitan* readiness tests. In addition to some of the prerequisites demanded by the test described above, these tests require general knowledge (e.g., What animal has humps on its back?), understanding of analogies and complex sentence structure (e.g., You wear a hat on your head and a glove on your _____?), memory span, accurate pronunciation, and knowledge of antonyms (e.g., When I say east, you say _____?).

Our research demonstrates that the prerequisites established for reading readiness by current readiness theorists are largely irrelevant. For example, *K*'s early reading achievements demonstrate that not even one of the seven subtests of the Gates-MacGinitie *Readiness Skills* test is relevant to readiness. *K* was ready to begin to learn to read when he was able to sit up, point, and understand some simple language. According to these criteria, normal children would be ready to begin to learn to read before their first or second birthday. Clearly, the prevailing notions of reading readiness are essentially mythological.

Advantages of Early Reading. Teaching a child to read early may provide a number of important benefits:

1. Reading increases the enjoyment in a child's life. Such enjoyment can be gained on his own.
2. As a source of knowledge, books enrich a child's life. They satisfy and stimulate a child's natural curiosity.
3. Parents' dependency on the school to teach reading is reduced. A child can learn the essentials at home and at his own pace.
4. Better readers are produced in terms of speed and accuracy.
5. The learning process can be enjoyable. In particular, rote-learning aspects (repetition and simple association) which are often found tedious and dull by the school-age child are much enjoyed by the younger child.
6. Relatively little time is required to administer the program—never more than 20 minutes per day.
7. A nationwide program of early reading has the potential of upgrading the overall educational level of children.

Insofar as disadvantages are concerned, we are aware of only one, but it is an important one. That is, despite admonitions and warnings, some parents may be insensitive or calloused in applying the program so that the child would suffer. Unfortunately, for the child such parents are likely to be a problem in other spheres of his life as well. Although such a distinct disadvantage cannot be denied, we nonetheless feel that the advantages to be gained are sufficiently significant to warrant the advocacy of a program for early reading.

As far as we could determine, there were no harmful effects of the program. Yet, there seems to be a variety of notions around about the “dangers” of early reading (see Durkin, 1968, for a survey of such ideas). For example, with regard to social adjustment, Bettelheim (1966) warns, “If the child can really read, he’s no longer interested in your reading to him. So at an early age you’ve already cut off the enjoyment of interaction, and the benefits he derives from it. You’ve already made him an isolate” (p. 40). Such a view is not supported by our data. On the contrary, we found that *K* continued to ask to be read to years after he was reading text. Far from making *K* an “isolate,” teaching reading and reading aloud to *K* brought parents and *K* even *closer* together.

At school, too, *K* has adjusted normally. Perhaps it is a matter of luck, but *K*’s teachers have always been understanding in dealing with his reading advantage. Nor has early stimulation adversely affected *K*’s visual acuity. His vision is normal and requires no correction. Recent research even indicates that early visual stimulation may be beneficial (Blakemore & Cooper, 1970; and Annis & Frost, 1973). There appears to be no evidence to support the contention that learning to read early is harmful.

The violinist, Shinichi Suzuki, reflects our own view on early childhood reading quite neatly. In defense of teaching young children to play the violin, he said, “When I have explained everything and they still ask me, all over again, ‘Why do you start them so young?’ I say, ‘Why would you deprive a child of such great joy for so long?’”

1. That the retarded can be taught the rudiments of reading has been demonstrated by Fuller (1974) and Doman (1971).

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