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AN EMPIRICAL INVESTIGATION OF EARLY READING RESPONSES OF YOUNG CHILDREN.

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TO TEST THE ASSUMPTION THAT THE READING PROCESS IS A NATURAL EMERGENCE OF LANGUAGE DEVELOPMENT, A HYPOTHETICAL STRUCTURE WAS DEVISED TO RECAPITULATE THE PROCESS THAT IT IS ASSUMED THE CHILD GOES THROUGH. EACH OF 25 PRINTED WORD SYMBOLS WAS PRESENTED IN THE FOLLOWING ORDER--(1) A PHOTOGRAPH OF THE SYMBOL IN ITS NATURAL SETTING, (2) A DRAWING OF THE SYMBOL IN ITS NATURAL SETTING, (3) A DRAWING OF THE SYMBOL IN ITS IMMEDIATE SETTING, AS STOP ON A STOP SIGN, (4) THE SYMBOL PRINTED IN ISOLATION, (5) THE SYMBOL PRINTED IN SENTENCE CONTEXT, AND (6) THE SYMBOL PRINTED IN STORY CONTEXT. THE TEST WAS ADMINISTERED INDIVIDUALLY AND ORALLY TO 82 4-YEAR- OLDS, 76 5-YEAR-OLDS, AND 71 6-YEAR-OLDS. SEVENTEEN OF THE 229 SUBJECTS READ ALL OF THE ITEMS, 109 READ SOME, AND 103 COULD NOT READ ANY OF THE ITEMS. OLDER CHILDREN READ MORE ITEMS THAN YOUNGER CHILDREN. EARLY READERS HAD HIGHER MEAN IQ SCORES THAN NONREADERS AND WERE LARGELY FROM HIGHER SOCIOECONOMIC LEVELS. THIS PAPER WAS PRESENTED AT THE INTERNATIONAL READING ASSOCIATION CONFERENCE (BOSTON, APRIL 24-27, 1968). (RJ)

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An Empirical Investigation of Early Reading Responses of Young Children

Introduction

Although there is much concern with preschool education and beginning reading instruction there is very little theorizing or investigation about what the child does when he first learns to read. A review of the literature in early reading reveals that some children learn to read before they have received formal reading instruction. Moore (4) found that some children learned to read through self-directed effort without being forced into highly specialized schemes. Terman (6) found in his studies of the gifted that nearly half of them learned to read before starting school and Durkin's (2) studies reveal data on socio-economic and mental factors related to preschool reading. Boney (1) advanced the theory that children learn to read as naturally as they learn to talk.

Basis for the Hypothesis

This study attempts to test the theory that children begin the reading process by discovering for themselves that printed words are substitutes for audible symbols which are used to identify objects, actions or situations. There is a world of difference between the concept of reading as a skill acquired only through formal instruction and the concept of reading as a natural emergence of language development. The basis for the theory is drawn from growth and development studies, from Piaget's observations of cognitive growth, and from various learning theories.

Ketcham (3) points out that speech and reading growth represent sequentially developing integrative levels in language growth and further emphasizes that reading is related to growth as a whole. Inference and analogy enable the investigator to use Piaget's work to support the theory that as the child interacts in a print culture he becomes aware of a printed word symbol, abstracts it from its contextual setting, classifies and orders it and assimilates it in a language system he knows. Printed word symbols are at first external "unknowns" and become internalized through the organism's experience in a print world. A stage by stage sequence from passive awareness to independent word recognition and use in a total of possibilities rather than in the first empirical situation is parallel to Piaget's (5) theory of transformed reality and assimilation of the known schema to schemas of other transformations. The child moves from stage to stage through a successive process of equilibration.

The extensive field of learning theory precludes an exhaustive report of inferential support for a theory of the reading process. A brief sketch of learning theory indicates the relevance of the young child's exploratory behavior which leads to curiosity and maximum contact with the environment, perception as something the organism does, and the sequential transition from purely sensory to cognitive perception as a function of memory.

One way to test assumptions is to state them in hypothetical model form and then observe and compare the response behavior of human subjects as they perform within the framework of the structure. In the interest of experimentation and exploration, and in the spirit of tentativeness, the investigator has devised a hypothetical structure (inventory) that embodies the hypothesis that occasioned it. The investigator admits the error of "value analogy" in assuming correspondence between various growth and learning areas and the stages of a reading process as presented.

Statement of Theory

It is assumed that a child's first printed word symbol recognition is made through use of any and all associated cues in meaningful context. The rapidity with which a child abstracts a word symbol from context and recognizes and uses it independently will be closely related to his intelligence. This is consistent with the theory that reading consists of differentiating symbols or decoding sounds and letters which have been arranged in patterns of arbitrary units. Reading consists of reconstructing the message in this code. These assumptions are consistent with modern learning theory which emphasizes perception, reinforcement, and meaningful integration of experience.

The hypothesis derived from the theory of this study is that children proceed through the process of learning to read in the following identifiable steps:

A. A child meaningfully experiences or becomes aware of a printed symbol in its natural setting, assisted by parents,peers, siblings, and others.

B. A child isolates the printed word symbol from its associated context, and the printed symbol becomes the primary focal point. At this point the child says the word when he sees it and is aware that the printed word "stands for" the spoken word.

C. A child recognizes that a printed word symbol is used to describe a number of similar but different situations. The printed word "STOP" is recognized in any and all contextual situations in which it may occur.

D. A child realizes that the symbol can stand alone without an associated context.

E. A child recognizes a cluster of printed word symbols in simple sentence structure.

It seems reasonable to assume that some children will be found who have not begun the process, some who have progressed part way, and some who have completed the process. The major dimensions which determine the process are age, intelligence, and socioeconomic background.

To test the existence of this process the investigator has devised a hypothetical structure which recapitulates the process the child goes through. Twenty-five printed word symbols selected on the basis of assumed frequency of occurrence in the child's natural environment are arranged in a series of response alternatives. The series includes the following:

A. Photograph of each symbol in its natural setting.

As it is impossible to test each subject at the actual place where a symbol can be seen, a photograph is used

to bring the place, situation, or object where a symbol is to the viewer. As the child views the photograph he exercises ready-made schemata, is able to view the "whole" undifferentiated setting.

B. Drawing of each symbol in its natural setting.

A drawing representing a "vanished object" is one step further than the photograph from the actual natural setting.

C. Drawing of each symbol in its immediate setting, as STOP, on a stop sign.

At this stage the child has begun the search for an object, an act, or a situation. He focuses upon a single aspect or a part of the whole, but needs some of the contextual background as supporting cues. Visual perception is becoming specific, intentional, and symbolically meaningful.

D. Symbol printed in isolation

At this stage the object, idea, event or situation can stand alone, or in Piagetian terms it has achieved object permanence in the thought of the child. The meaningful substitution of the printed word symbol for an object, an act, or a situation has been assimilated or internalized. It is remembered without the aid of visual contextual cues.

E. Symbol printed in sentence context.

At this stage the schema is repeatable and generalizable. The child utilizes and incorporates it in assimilative fashion and can use it for social adaptation.

F. Symbol printed in story context.

This stage is an extension of the fifth stage and provides additional accommodation and assimilation of the reading schema.

In summary, then, the child alternates from an active to a passive to an active role, assimilating, integrating, organizing, adapting, and accommodating the print stimuli to a language system to which he is born. The steps in the inventory are:

A. Photograph of each symbol in its natural setting.

B. Drawing of each symbol in its natural setting.

C. Drawing of each symbol in its immediate setting; for example, STOP, on a stop sign.

D. Symbol printed in isolation.

E. Symbol printed in sentence context.

F. Symbol printed in story context.

The symbols are the following: Stop, In, Life, Coca Cola, One Way, U.S. Mail, Little Red Riding Hood, School, House for Sale, Slow, Cheerios, House for Rent, Pass with Care, Open, Wonder Bread, Post Office, The Three Bears, Entrance, Out, Exit, Do Not Enter, Keep Right, Speed Limit 25, Milk, Apples. Symbols of more than one word are considered as single items in this study; for example, U.S. Mail and Wonder Bread are composed of more than one word but represent single meaningful printed symbols. It is assumed that the child recognizes the total meaningful printed symbol and not just a single printed word symbol.

Method

The total inventory consists of 150 items--twenty five printed word symbols with a six-stage sequence for each. It is possible that the inventory, the hypothetical structure, measures responses to arbitrarily selected printed word symbols which may or may not be representative of an individual's total reading ability. However, for the purpose of testing the theory of the reading process it seems reasonable to assume that the words constitute a child's natural print environment. The first three steps (A,B,and C) consist of the printed word symbol in its natural setting, and the remaining steps (D,E, and F) consist of the printed word symbol outside its natural setting.

The inventory was administered to a group of four-, five-, and six-year-olds individually and orally by the investigator, Individual differences were considered in time allotment decisions. The examiner first tested each subject on step A, the photograph of a printed word symbol in its natural setting. At each presentation the examiner pointed to the word or words and asked, "What does it say?" If a subject made a correct response to step A of any of the twenty-five photographs the examiner tested the subject on step B and step C during the first test situation. If, after two trials, a subject did not respond correctly to step A for any of the items, the examiner considered the subject's responses in the "no-response" category. In this study, it was assumed that further testing was unnecessary. While it is possible that giving each subject a chance to respond to all six steps whether or not he recognized the words at step A would have more accurately tested the step-by-step sequence, the investigator considered two trials on all twenty-five words in the photographs a reasonably reliable criterion of reading status. Then, too, continuing the test beyond step A after two totally unsuccessful trials could have created a frustrating experience for the child. If an incorrect response to the question indicated misunderstanding of test directions or a response to another cue, the examiner again pointed to the specific word and asked, "What does it say?" If a subject recognized additional words in context, this information was recorded in a verbatim report of the subject's verbal responses.

The remaining three steps were used in a later testing session. In view of the possibility that a child might learn the word in the

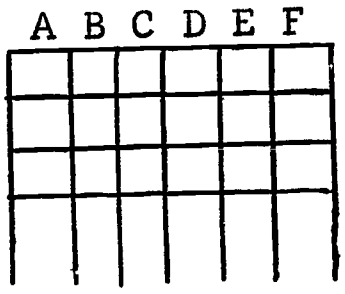
first session, a time interval of one week was allowed between the two tests. It is assumed that the abstraction of the printed word symbol from its natural setting at step D is the stage at which the subject perceives the printed word as a substitute for an object, an act, or a situation. A subject may make no correct responses beyond point C. In such a case it is assumed that he cannot recognize the printed word symbols used in this study in isolation or in language context. The inventory was scored by counting the number of correct responses to the items. If a subject responded correctly to one printed word symbol, or item, at the first step (step D, isolation), he achieved a score of 4. A subject may recognize items at different step levels; for example, item 12 through step B, item 18 through step A, item 6 through step E. A total score of 150 is arrived at by multiplying the correct responses to twenty-five items by the six sequential steps at which each item may be recognized. Consequently, if a child responds correctly to all twenty-five items through step 6 he has a score of 150, the highest possible score on the inventory. Scores are recorded on a profile chart which also contains data on age, I.Q., Socioeconomic status, and the subjects verbal report.

Inventory Profile

Name
Address
Date of Birth
Father's Name - School and Grade Completed - Occupation
Mother's Name - School and Grade Completed - Occupation
Siblings
Stanford-Binet
Reading Test Score
Word Test

Verbatim Report

Stop



Subjects

The subjects for this investigation were 229 children in the following age groups: 82 four-year-olds, 76 five-year-olds, and 71 six-year-olds.

Limitations

The exploratory design of this study limits the general applicability of the results. As the results are used to identify relationships between groups differing in age, sex, and socioeconomic status, they do set the stage for further experimental study.

Another limitation is the fact that the inventory was not standardized, but the results could provide a basis for preparation of a more precise instrument for measuring early reading status and reading readiness.

It is generally recognized that early readers are bright children, and the selection of subjects who could read at an early age thus resulted in an overrepresentation of high-I.Q. subjects. This sampling bias restricts the possibility of making inference about an group of children other than those used in the present study.

The exploratory nature of this study precluded direct evaluatio of the multiple factors related to early reading ability. However, investigator did note informally the subject's hearing and vision an found no serious defects.

Despite the limitations indicated above, certain conclusions ca be drawn from the analysis of the data.

Results

The results of the inventory show that 17 of the 229 subjects read all of the items, 109 read some and 103 could not read any of

the items; the data are reported as mean recognition scores for items; for example, a mean score of 4.00 indicates that an item was recognized through step D, the level of abstraction. Subjects who recognize some words in isolation (step D) recognize other words only at step A, others through step B and some through step C. It is theor ally assumed that a subject who recognized an item at step D at the time of this study recognized the item at step A, B, and C at some earlier time and progressed in a sequential manner. As an individual's response to each item recognized constitutes a step by step recognition pattern and as the pattern of response (mean scores for items) for the total population shows the same dispersion over the six step sequence, it is projectively inferred that the reading process occurs in a step by step sequence. Children who recognized some words at various steps seemed to move gradually from a first step of awareness of printed word symbols in the photographs to a search for futher cues. One subject said the word Private for the item School and explained that the sign is near his home. He pointed to the letter M in Milk and said it begins like Mark, his name. The response to the word School seems to indicate an awareness that the print symbol represents a word he knows, in this case, Private. In the word Milk the child recognized a specific cue. Some young children asked to see the photograph again when they could not recognize an item in isolation.

Many children said Slow for School and vice versa for both are symbols on signs of the same shape and color. Many said Stop when shown only the shape of the Stop sign. One child said he can't read

a word unless he knows the word first. He offered the information that saying a word isn't reading it. Many children said they can read words on pictures but that's not "real" reading. Some children identified several items as "non-school" words. One child said Yife for Life and recognized the word through the six steps. It cannot be known for certainty how the child perceived the "L" but his response does not seem to be dependent on the visual or auditory discrimination of the letter L but on the global meaning he attached to the symbol Life associated with the cereal box he recognized in the picture. The recognition of Coca Cola printed in fancy cursive style and Stop printed in Roman Bold face type seems to indicate that the style or type of print made no difference. Some subjects could name objects in the photographs but could not recognize the corresponding printed word symbols.

Many young children seemed to recognize words in their semantic setting. For example, some children said they recognized Entrance because it is like Exit.

If it can be assumed that chronological age reflects maturation the results of this study show that reading at an early age is related to maturation.

Early readers had higher mean I.Q. scores than non readers and were largely from higher socioeconomic levels. No significant difference in early reading status was found between boys and girls.

Implications

The findings of this study hold implications for reading in the school situation. The theory that the reading process derives from

learner-environment interaction suggests that reading is an integral part of all learning activity and not a separate school subject. The children's comments indicate the importance of oral language as a basis for discovering the reading process and point to the importance of the language experience approach to reading instruction.

The question of whether or not to teach reading at the kindergarten level becomes pointless when reading is viewed as a natural outgrowth of language development. Reading, then, is a mental process and begins with the child's first stage of awareness, has no identifiable end point and cannot be considered in a grade level context. Reading readiness, as a state of the organism, is considered the existing schemata which make it possible for the child to profit from experience.

If the results of this study, the children's responses and the report of their perceptions of the reading act reveal the nature of the reading process perhaps an over emphasis on teaching methods and materials needs to be questioned and examined more carefully.

The results suggest that since no antecedent or postinventory events are measured in this study, a longitudinal study is necessary to measure an individual's progress along the six step continuum. Such a study is now in progress.