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Martha Evans, Nancy Taylor and Irene Blum

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CHILDREN'S WRITTEN LANGUAGE AWARENESS AND ITS RELATION TO READING ACQUISITION

Martha Evans
University of Oregon

Nancy Taylor
Catholic University

Irene Blum
University of Maryland

Abstract. Describes the development of an instrument which identifies what children who are just beginning first grade reading instruction know about the written language code and relates this knowledge to beginning reading achievement. A battery of seven tasks was developed to assess (a) discrimination of real writing from geometric shapes and letter-like forms; (b) segmentation of aurally presented sentences; (c) segmentation of visually presented sentences; (d) equation of oral written word lengths; (e) ability to predict from pictures; (f) completion of aural sentences with and without graphic cues and (g) competence with the metalinguistic aspect of reading. Tasks were administered to 53 first grade children and scores were analyzed by stepwise multiple regression on standardized reading test scores. Findings indicate that linguistic awareness tasks do predict reading achievement, particularly those tasks which stress the interrelationship between oral and written codes rather than those which tap characteristics specific to the writing system.

INTRODUCTION

Increased knowledge of the skills and concepts involved in reading acquisition should lead to improvement in initial reading instruction, but our current state of knowledge about these skills and concepts is extraordinarily meager. For a decade there has been a focus on language development in an attempt to understand the process of learning to read. (Barr, 1974-75; Biemiller, 1970; Bougere, 1969; Cohen, 1975; Goodman, 1969; Livo, 1970; Ruddell, 1966; Sampson, 1962; Weber, 1970).

John Downing's theory of cognitive clarity (1973) suggests an additional focus of research and reading acquisition (i.e., that children approach the learning to read task in a state of cognitive confusion about the purposes and mechanisms of reading). Prior to formal instruction in reading the child has already acquired a rich array of skills in oral language; in learning to read s/he must learn to deal with a new linguistic code (i.e., written language). This new learning may at times be in conflict with what the child knows about the oral code.

The theory of cognitive clarity suggests that research on reading acquisition examine the interface between the oral language the child brings to initial reading instruction and the task requirements of reading acquisition. This interface may involve children's ability to deal abstractly with language and their developing understanding of how written language works. If learning to read involves progressively more accurate identification of distinctive graphemic features to confirm the reader's predictions (Smith, 1971), then there may be a level of understanding of the conventions of the written code that is either necessary to begin reading or which develops as children learn to read.

PURPOSE AND TASK RATIONALE

This study describes the development of an instrument which attempts to identify and systematically measure what children who have just begun first grade reading instruction know about the written language code, and to see whether this knowledge relates to beginning reading achievement as measured by standardized tests. A battery of seven tasks was developed to measure what children know about the way the written code operates and their ability to deal with language on an abstract level. The tasks include: (1) Identification of Written Language; (2) Aural Word Boundaries; (3) Visual Word Boundaries; (4) Mow-Motorcycle Task; (5) Picture Sentence Length; (6) Aural Consonant Cloze; (7) Metalinguistic Interview.

A pilot study was conducted with a nursery school population to determine whether the tasks in the battery differentiate between groups of children rated by their teachers as not reading but ready to read and children considered not to be ready to read. The results indicate that the tasks identify the groups of children in the same way as the teachers.

The present study investigates the relationship of first grade children's performance on these seven written language awareness measures in September and their reading performance in June. Theoretical rationales and descriptions of the tasks in the battery are as follows.

1. Identification of Written Language. The first task in the battery assesses the subject's ability to discriminate manuscript writing from other kinds of marks. Eleanor Gibson (1970) has speculated that the natural history of reading has twin origins: a linguistic origin and an origin in writing. Just as the child comes to school with much tacit knowledge of his linguistic system, so, Gibson feels, does the child abstract some notions of the writing system. Reading, however, involves the notion of a standard orthography: the notion that ideas can be represented by particular symbols that decode into ideas. Gibson (1968) found that when she showed children cards with line drawings, scribbles, manuscript and cursive writing, artificial letters and numbers, and asked children to tell what the cards were, 3 year old children at a university nursery school could separate pictures from writing, numbers, and scribbles. In a high socioeconomic kindergarten population, 75 percent of the 4 year olds could distinguish scribbling from cursive script. However, this finding was not maintained across socio-economic levels. It was hypothesized in the present study that the initial stage in learning to identify distinctive features of print may be the ability to recognize English orthography.

To assess whether or not children could diffentiate messages written in English orthography from strings of geometric shapes and letter-like forms, a sorting task was created for this battery. This task consists of 12 cards: three with sentences in manuscript, three with sentences in cursive, three with strings of geometric shapes, and three with letter-like forms originated by Gibson and used in her distinctive feature research. The geometric shapes and letter-like forms are grouped to resemble the spacing of sentences in English orthography. Children are told that the cards are messages left in the examiner's mailbox, only someone has played a trick on the examiner. Some of the messages are in real writing but some are just other kinds of marks. The child is asked to help the examiner by separating all the messages with real writing (i.e., manuscript and cursive). The task is scored on the basis of the number of cards correctly assigned to each category. Scores can range from 0 to 12.

2. Aural Word Boundaries. The second task requires children to segment oral sentences into their component words. Children's experience with oral language is that of a vehicle for intentional communication of meaning. As such it is tied to context and highly involved in the affective aspects of the child's life. It is the situation and the meaning that are paramount to the child. The surface aspects of language, the medium for transmitting the message, are *transparent* and therefore beyond the awareness of the child. In learning to read the child may need to focus his attention on the very aspects of language that function out of awareness in oral language, i.e., the surface structure which transmits the message. Karpova (1966) found evidence that preschool aged Russian children who could segment orally presented strings of unrelated words into their components, were not equally successful in segmenting sentences. Identification of aural word boundaries appears to measure the ability to deal with the form, rather than the content, of a message. The acquisition of this ability would seem to facilitate cognitive clarity, for beginning readers are typically required to deal with the written code at a word level rather than as a unified message.

The aural word boundary task used in the written language awareness battery is a shortened version of a test developed by Evans (1975) and is based on Karpova's work. The four sentences used are those which had the highest item-total score correlations of the 10 in the original test. Children hear and are asked to repeat each sentence. After each repetition they say the sentence again and designate each *word* by moving a small wooden block. All children had previously demonstrated the ability to segment strings of unrelated words. Responses are classified as levels 0, 1, 2, 3, or 4. Level 0 indicates no response from the child with no blocks moved at all. Level 1 indicates no divisions within the sentence with the child moving only one block for the entire sentence. Level 2 is indicative of a single division between subject and predicate; Level 3 indicates division between more than subject and predicate but not identification of every word; and Level 4 indicates division for every word in the sentence. This division is based on the conclusions from Karpova's work. Points for each sentence are summed and scores on this task can range from 0 to 16.

3. Visual Word Boundaries. Learning to read may involve learning to associate groups of letters with their spoken counterparts. Since written words are defined by the white spaces between them, Meltzer and Herse (1969) hypothesized that the ability of the child to determine the boundaries of written words would influence his/her ability to form an association between written and spoken words. This knowledge of written word boundaries was considered to be an appropriate component of the Written Language Awareness battery.

Meltzer and Herse examined the ability of 39 first graders to discriminate written word boundaries after 2½ months of formal reading instruction. To determine the extent to which children use space to define word boundaries, Meltzer and Herse presented children with a written sentence and asked them to circle every word. Statistical analysis resulted in the identification of six stages of ability. The visual word boundary task used in the present study involves presenting the child with the sentence "Seven cowboys in a wagon saw numerous birds downtown." printed in manuscript letters. The sentence is not read to the child; instead, s/he is told to count the words and then to put a circle around each word. The scoring system reflects the stages identified by Meltzer and Herse: 0 points if the child lacks the concept of putting circles around words; 1 point if the child makes random combinations of letters and spaces; 2 points if the child circles every letter as a word; 3 points for performance which combines short words (e.g., in a) into one word; 4 points for differentiation of short words, but division of long words; 5 points for division of long words containing tall letters and made at the tall letters; and 6 points for perfect performance.

4. Mow-Motorcycle Task. In learning to read, children discover how their spoken code is mapped in the orthography. One aspect of this relationship is the awareness that the speech stream is mapped onto printed symbols and the length of the spoken word is a cue to the length of the printed word. Rozin, Bressman and Taft (1974) investigated children's awareness of this relationship using a task that requires the child to identify the printed word that corresponds in length with a spoken word and found that many of their 218 subjects, from kindergarten through second grade, were not successful at this task, including inner-city first grade children with a year of reading instruction. This task seems to tap an awareness of a basic relationship between speech and print. The task developed by Rozin et. al. (1974) is directly used in this study. Children are presented with eight cards containing pairs of printed words beginning with the same letter. The child is told, "One of these words is *mow* and the other is *motorcycle*. Which one is *mow*?" The child responds by pointing. Items are counter-balanced by length of target word and position of the long and short word on the card so that an inappropriate response set (i.e., always pointing to the top word) cannot result in a better than chance score. The total score is the number of correct responses, with 0 to 8 points possible.

5. Picture Sentence Length. The fifth task attempts to extend the mow-motorcycle task in two directions. One is to combine it with the visual word boundary concept and determine if children are aware that groups of printed words represent more than a one word label. Pre-reading children may not be aware of the rela-

tionship between the number of verbal equivalents one produces for a number of written words. Also, attending to the full length of the printed message may be more difficult when there is other distracting information on the page, such as pictures. Therefore, a task was developed to assess children's ability to differentiate one word from multi-word labels on pictures. Children are presented with 10 picture cards from the Peabody Language Development Kit (1965) which can be labeled with one word (e.g, trashcan, rabbit, sandwich, etc.). Half of the pictures are labeled with one word and half are labeled with sentences. The child is shown the picture and told "I have some pictures with writing on them. What do you think this says?" The examiner moves her finger under the print while giving directions. Items are presented randomly and are scored on the basis of whether the child gives a one word or multi-word response to a one word or multi-word caption. The child does not need to read every word correctly; s/he need only indicate that s/he recognizes that there is only one or more than one word in the caption. Scores can range from 0 to 10 points.

6. Aural Consonant Cloze. This task examines children's ability to integrate their predictions from content with the printed information available to them. Biemiller (1970) noted that children reach a stage in reading acquisition at which they become very aware that a printed word represents a particular spoken word, not just any word that will make sense in the specific context. Williams (1971) found that the initial consonant was a salient feature for first graders in word identification, and Shankweiler and Liberman (1972) found that initial consonants were more apt to be identified correctly by beginning readers than other word parts.

Children have had many meaningful encounters with print prior to coming to school. While these exposures may vary in quantity and quality, it is possible that children have naturally deduced the importance of orthographic features of the written code.

To investigate children's awareness of orthographic aspects as cues to word identification, a partial cloze task was constructed. This task is composed of ten sentences printed on separate cards with the final word underlined. The child is shown each card, one at a time, and told that the examiner will read almost all the words in the sentence but will not read the last word. The examiner points out the underlined word on the first card as directions are given. The child is asked to help the examiner complete each sentence by supplying a final word. This task is concerned with prediction from context as well as attention to orthographic cues. Based on Biemiller's findings (1970) that attention to graphics represents a more advanced stage in initial reading, the following scoring system was devised. Points assigned to each response ranged from 0 to 3 according to the following criteria: 0 points for no response; 1 point for a response that makes sense but does not begin with the same initial consonant; 2 points for a response that begins with the appropriate consonant, but does not make sense; and 3 points for a response that begins with the appropriate consonant and makes sense. This yields a total of 0 to 30 possible points.

7. **Metalinguistic Interview.** This interview is a set of questions designed to assess children's understanding of the language of instruction, and their understanding of the way books operate. Clay (1966), Downing (1970, 1971-72), Reid (1966), and Denny and Weintraub (1966) have all interviewed young children and found that they do not have clear concepts of many of the terms used in initial reading instruction, such as alphabet, letter, word, and sentence. Knowledge of the appropriate referents for these terms appears to be an indication of emerging cognitive clarity in young children learning to read. The ability to correctly *approach* a book indicates that the child can at least imitate those aspects of the reading act which are observable to him.

The items in the metalinguistic interview used in this study include demonstration of the knowledge that the term alphabet and/or ABCs refers to letters, oral identification and actual location on a page of a single letter, word, and sentence. Children are then given a book and asked to demonstrate where one would begin reading it, including where on the page, and where one reads next when a page is finished. A full page picture is included as a distractor. Scores on the interview range from 0 to 11.

Summary of Tasks

The seven tasks included in the written language awareness battery were selected and developed to measure what children know about the written language code and its relation to oral language. None of these concepts are traditionally included in reading readiness tests and it was hypothesized that performance on the battery may yield unique information about the existence of specific aspects of cognitive confusion in children who have not received formal reading instruction.

PROCEDURES

Population

The sample for the study is drawn from two schools in a large metropolitan Washington school system that agreed to participate in the study. These schools draw from middle class and lower middle class neighborhoods which represent the racial makeup of the county. There were 26 boys and 27 girls, none of whom had had a formal reading instructional program in kindergarten. While the results of this study cannot be generalized beyond the two schools, the 53 first graders participating in the study were randomly selected from the total population of 145 first graders in the two schools.

Test Administration and Description

Testing was conducted from the fourth to the seventh week of school. Children were tested individually by the three investigators in rooms separate from the classrooms. To control for effects of direct instruction on the abilities being assessed, teachers were kept unaware of the nature of the tests beyond the fact that children were receiving readiness tests. The tests were administered in the following

order to avoid contamination from incidental learning during testing: 1. Identification of Written Language; 2. Aural Word Boundaries; 3. Visual Word Boundaries; 4. Mow-Motorcycle; 5. Picture Sentence Length; 6. Aural Consonant Cloze; 7. Metalinguistic Interview.

Metropolitan Readiness Test scores were obtained from the classroom teachers who had administered the MRT two weeks prior to the beginning of this study.

In May the comprehension section of the Metropolitan Achievement Test, Primary 1, Form F was administered. Testing was done by the investigators with groups ranging from 10 to 15 children.

Table 1 reports the reliabilities of the measures determined in September. Test-retest reliability was established for the written language identification, aural word boundary, visual word boundary, and aural consonant cloze tasks. Internal consistency (Cronbach, 1951) was used to determine the reliability of the scores from the mow-motorcycle, picture sentence length and metalinguistic interview. The reliability coefficients range from .55 to .91.

RESULTS

Validity

All of the tasks composing the written language awareness battery were chosen or developed as measures of children's understanding of aspects of the oral and written language codes, and therefore have some measure of face validity. Earlier administration of the aural word boundary task (Evans, 1975) indicated a relationship with beginning reading achievement, and the visual word boundary and mow-motorcycle tasks had both been developed to investigate first grade children's understanding of how print works. The written language identification, picture sentence length and aural consonant cloze tasks were designed to measure specific linguistic awareness concepts, and were revised after initial piloting. The items on the metalinguistic interview reflect input from a number of other sources concerned with linguistic awareness of non-reading children (Clay, 1966; Denny and Weintraub,1966; Downing, 1971-72, 1974-75; Reid, 1966).

Table 1 presents the means and standard deviations of the subtest scores for the September and May administrations. On all of the subtests there is growth and a narrowing of the range of performance during the first year, indicating that these behaviors are developing as children learn to read.

These tests were developed to look at concepts which are not included in traditional readiness tests. The coefficients of correlations between these measures and total scores on the Metropolitan Readiness Test were determined and are presented in Table 2. With the exception of the written language identification task ($r = .24$), the coefficients range from $r = .46$ to $r = .68$, indication that the written language awareness tasks may be tapping the general domain of reading readiness, but are providing some additional information.

Intercorrelations of Subtests

One purpose of this study is to develop a procedure for assessing written language awareness in young children. The tasks included in this battery were selected to tap various aspects of this awareness and the scores should show some relationship among measures. An examination of the intercorrelations of the tasks, presented in Table 2, suggest that six of the tasks share substantial variance; abilities that contribute to the variance on one task appear to contribute to the variance on one or more of the others.

Predictive Value of the Subtests

Coefficients of correlation of the subtest scores with end of the year reading achievement were determined to explore the relationship between these abilities and reading acquisition. Table 2 presents the correlation coefficients with the reading comprehension subtest scores from the Metropolitan Achievement Test, Primary 1, Form F, administered in May. Six of the seven tasks show statistically significant coefficients of correlations with the reading comprehension scores, although the visual word boundary task does not show a strong relationship.

TABLE 1

Descriptive Data for Written Language Awareness Subtests and Reliabilities

	September		May		Reliability
	X	S.D.	*X*	S.D.	
1. Written Language Identification (WLI; 0-12)	8.98	5.15	11.62	1.36	.55[1]
2. Aural Word Boundaries (AWB; 0-16)	11.20	2.47	12.87	1.60	.95[1]
3. Visual Word Boundaries (VWB; 0-6)	4.86	1.26	5.45	.82	.91[1]
4. Mow-Motorcycle (M-M; 0-8)	5.75	1.80	7.74	.59	.69[2]
5. Picture Sentence Length (PSL; 0-10)	5.90	1.64	9.55	1.35	.82[2]
6. Aural Consonant Cloze (ACC; 0-30)	23.28	3.47	27.94	2.88	.55[1]
7. Metalinguistic Interview (MLI; 0-11)	7.11	2.31	9.92	1.50	.81[2]

[1]Reliability established using test/retest

[2]Reliability established using coefficient alpha

TABLE 2

Written Language Awareness Subtest Intercorrelations and Correlations with Metropolitan Readiness Test Total Score and Metropolitan Achievement Test Reading Score

	AWB	VWB	M-M	PSL	ACC	MLI	MRT	MAT
WLI	.27	.12	.08	.002	.10	.21	.24	.29
AWB		.17	.13	.08	.30	.34*	.50*	.52*
VWB			.33	.39*	.27	.28	.46*	.31
M-M				.47*	.48*	.60*	.59*	.61*
PSL					.75*	.43*	.52*	.43*
ACC						.49*	.68*	.61*
MLI							.58*	.62*

* $p < .01$

TABLE 3

Stepwise Regression of Written Language Awareness Subtests on Metropolitan Achievement Tests Reading Scores

	Multiple R	Increase in Variance Accounted For	Beta	F
Metalinguistic Interview	.62	.38	.148	1.54
Aural Consonant Cloze	.71	.13	.325	4.96*
Aural Word Boundaries	.76	.08	.305	9.36*
Mow-Motorcycle	.81	.07	.346	8.88*
Written Language Identification	.81	.01	.102	1.24
Picture Sentence Length	.82	.002	-.088	0.36
Visual Word Boundaries	.82	.001	.038	0.15

Subtest scores were also entered into a stepwise multiple regression equation to determine which combination of subtest scores provided the most accurate prediction of May reading performance. The results, presented in Table 3, may reflect a loss of power due to the relatively small sample size ($N = 53$) for consideration of seven independent variables.

The combination of scores from the WLA battery predict scores on the reading subtest of the Metropolitan Achievement Test with an accuracy which equals the Metropolitan Readiness Test for this population ($r = .82$). The first four variables entered into the equation appear to account for most of the variance in the achievement test scores. The Metalinguistic Interview was the first variable entered in the equation. The program used to analyze the data only provided for forward inclusion of the variables. Once a variable is entered it is not dropped, although subsequently entered variables may share much of the explained variance. The F value of the Metalinguistic Interview dropped as other variables were entered into the equation, indicating that it shares much of the variance with the other predictors.

DISCUSSION

The written language awareness battery developed for this study attempts to assess children's understanding of the way the written code operates, the properties which relate it to the oral code and the features which distinguish it from the oral code. Prior to reading instruction the child has a tacit understanding of oral language; understanding the nature of written language must be acquired in learning to read. Developing this understanding may be a major source of difficulty for some children.

The points of particular interest suggested by the results of this study are:

1. It is possible to develop systematic measures of written language awareness of first graders which seem to provide information pertinent to reading instruction.

The WLA battery combines existing instruments (mow-motorcycle, visual word boundaries, aural word boundaries) with instruments developed and piloted by the investigators (written language identification, picture sentence length, aural consonant cloze, and metalinguistic interview) to measure aspects of the construct of written language awareness.

Although two of the tasks have fairly low reliabilities (WLI and ACC), the other five appear to be accurate stable measures of specific abilities. The subjects used in this study appeared to understand the directions and to enjoy the tasks. In September the tests were sensitive to differences in performance. The scoring criteria identified were easily applied to the specific responses.

2. Scores on six of the seven written language awareness tasks have statistically significant coefficients of correlations with end of the year reading comprehension subtest scores on the Metropolitan Achievement Test.

The abilities measured by the written language awareness tasks appear to be predictive of later reading achievement. Those children who had a better mastery of linguistic awareness at the beginning of the year were, in fact, better readers at the end of the year. It is possible that the skills tapped by these tasks are involved in the process of learning to read.

3. Scores on five of the seven written language awareness tasks show

statistically significant coefficients of correlation ($p > .01$) with total scores on the Metropolitan Readiness Test. Results of multiple regression analysis indicate that the WLA battery and the Metropolitan Readiness Test scores predict May reading achievement equally well. While the MRT may be the most efficient way for predicting reading achievement, it only provides a global notion of readiness for reading instruction. The WLA, on the other hand, provides information that is more specifically related to the tasks of reading acquisition; information that can be used diagnostically to adjust instruction.

4. Performance on those tasks which called for interaction of the oral and written codes and those which tapped the language of instruction are more strongly related to learning to read than those which only ask for decisions about printed language.

The multiple regression analysis confirms that knowledge of the language of instruction is incomplete on arrival in first grade and sets the metalinguistic interview as the best predictor of the reading scores. The next three tasks which are entered into the equation, aural consonant cloze, aural word boundaries and mow-motorcycle, do not deal solely with auditory or visual recognition of aspects of language, instead they reflect an integration of the oral and written codes. In the aural consonant cloze task the student is rewarded for integrating predictive aspects with graphic symbols. It may be the task which most closely approximates the activity of reading. The aural word boundary task requires the child to focus on the surface structure of oral language at the word level, rather than on a meaning level, and to think objectively about how those meanings are represented in language. The mow-motorcycle task requires that the child focus on one aspect of the aural symbol, its length, and match it with the longer printed stimulus, thereby integrating oral and written codes on this single factor. All of these tasks call for decision making by the child and an active interaction with his language.

The three tasks entered last focus more on the printed symbol and conventions of orthography. These tasks did not significantly increase the amount of explained variance.

CONCLUSIONS

The results of this study indicate that it is possible to identify and systematically measure aspects of written language awareness that are related to beginning reading achievement. The findings also indicate that certain aspects of written language are better indicators of potential reading achievement than others. Those tasks which stress the inter-relationship between the oral code and the written code are more highly correlated and predictive of reading achievement than those which tap characteristics specific to the writing system. Children who are more proficient at these integrating tasks in September appear to be better readers in June.

The tasks which contributed least to the predictive value of the WLA battery were those which focused primarily on visual aspects of print. It may be that it is not necessary to focus on the specific conventions of print or to consistently attend to them to promote success in reading acquisition. The results of this study indicate that understanding the relationship between oral and written language seems to be more significantly related to reading achievement.

Our understanding of the process of learning to read and the development of cognitive clarity in children can be improved by further investigations in the area of written language awareness. A developmental study examining changes in these abilities as reading instruction progresses might yield further insights into the exact nature of the process of cognitive clarity. Fereiro has data that indicate there may be developmental constraints on the ability to form some of these concepts. Nevertheless, it would be interesting to see to what degree either instruction in these concepts or more meaningful exposure to print, allowing naturalistic, incidental learning, would facilitate reading acquisition.

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