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By-Holden, Marjorie H.; MacGinitie, Walter H.

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An evaluation of kindergarten children's awareness of lexical units and of the relationship of this variable to prediction of beginning reading is presented. Eighty-four kindergarten children--47 boys and 37 girls--served as the subjects and were tested individually for their ability to identify word boundaries spoken in sentences. The study concluded that function words were more difficult to isolate than words having more lexical meaning. The child's sensitivity to the rhythmic aspects of an utterance may influence the way he segments that utterance. Correlations between the testing instruments used in this study and reading readiness test scores were low. Additional conclusions, references, examples of test items, and response patterns are included. (RT)

CHILDREN'S CONCEPTIONS OF WORD BOUNDARIES AS A FUNCTION OF DIFFERENT LINGUISTIC CONTEXTS*

Marjorie H. Holden and Walter H. MacGinitie

Teachers College, Columbia University

The purposes of this study were to investigate young children's understanding of word boundaries in the auditory mode, and the relationship between this understanding and standard predictors of later reading achievement.

Authorities in the fields of both reading and children's language development are aware of the theoretical and practical aspects of these questions, as they relate to both language acquisition and the acquisition of skills necessary for successful beginning reading. Our discussion will deal only with the studies most relevant to our own.

As early as 1923, Piaget noted that children "can make a correct use of certain difficult terms in their speech, and yet are incapable of understanding these terms taken by themselves". [p. 146] Piaget concluded from this that awareness of the sentence precedes awareness of individual words.

According to Slobin's English abstract, Karpova (1955) studied Russian preschoolers' awareness of lexical units. A lexical unit is to be understood here as a word, the conventional dictionary entry (except for affixes), the unit that is conventionally preceded and followed by a space in written language.

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The data for this paper were collected in the Shrub Oak Elementary School in Shrub Oak, New York. We would like to acknowledge the valuable assistance we received from the principal, Mr. Joseph Ranellone, and the two kindergarten teachers, Mrs. Judith Mayes and Mrs. Virginia Senk.

A major finding of the Karpova study was that Russian children from three and one-half to seven generally could not dissolve a sentence into its lexical units. Before the age of seven most of the children were able to distinguish nouns and make a simple binary division of the sentence indicating the complete subject and the complete predicate. The children experienced the most difficulty in identifying and isolating prepositions and conjunctions. Karpova obtained these results by employing two different methods. Before the experimental task was attempted, the children were trained, with concrete objects, to demonstrate their estimate of the number of lexical units within a stimulus sentence, and the specific word or words that corresponded to each ordinal position. Some children were able to advance from this method to a purely verbal one wherein they repeated the utterance verbatim, gave the total number of words in it, and then in response to the examiner's specific request pronounced the first word, the second word, and so forth. The concrete method was apparently useful, inasmuch as certain children, presumably the youngest, could respond correctly only when they were permitted to combine a verbal response with a motoric one.

Huttenlocher (1963) hypothesized that "the first multiple word utterances are learned as single units, and only later differentiated into separate words". In a study employing 66 children between four and one-half and five years, she presented half with the task of separating two-word sequences and half with the task of reversing the two words in these sequences. The most difficult items for the children to separate and reverse were those that they would have been most likely to hear and use in every day speech as language units, such as <u>it is</u> or <u>red apple</u>.

The sequences that were easiest to separate correctly were those that arise seldom in ordinary spoken language, for example table goes and D-7.

Cheppell (1968) has also reported a study of children's awareness of lexical units. She considered not only the age of the children, but their sex and socio-economic status and found a significant difference in performance between socio-economic levels. She did not, as Karpova had, employ concrete counters for the children to use in indicating their responses.

The aim of our study was to extend previous findings in two different areas. First we attempted to evaluate kindergarten children's awareness of lexical units using a greater variety of utterance types. Secondly we attempted to investigate the relationship of this variable to predictors of beginning reading. Previous studies seemed to agree that young children and the conventions of printing segment utterances somewhat differently. It seemed possible, therefore, that a child's success in beginning reading might be related to his understanding of word boundaries. Among linguists, the late C.C. Fries specifically suggested that instruction in this skill precede formal reading instruction.

Our subjects were 84 kindergarten children, 47 boys and 37 girls. They comprised the total 1967-68 kindergarten enrollment of an elementary school in northern Westchester County, New York. The population of the school is white and predominantly middle-class. The children ranged in age from five years, four months to six years, eight months. The median age was five years, eleven months.

The children were divided into three groups. Each group was tested with a somewhat different version of our instrument. The changes introduced in the later versions reflect our attempts to validate

patterns suggested by the earlier sets of responses. The three versions are shown in Table 1.

In scoring responses, one point was given for each word boundary that the child correctly identified. One point was subtracted whenever a boundary was incorrectly inserted within a word, or rarely, within a syllable. Omissions of words received no credit, but neither were they penalized. The child's total score represented the sum of the scores received on each individual item. The final form of our instrument had a split-half reliability of .90.

The children were tested individually. The child was seated at a desk opposite the examiner, and told he was going to play a "talking and tapping game". Then he was shown eight poker chips aligned horizontally in front of him. The procedure began with a demonstration of the game using the model utterance, Elephants live in the zoo. This utterance was effective in demonstrating that neither syllabication nor compounding of words was correct. The examiner showed each child how she moved her finger from one poker chip to the next as she said each word. After this example, three tape-recorded sample items were administered. Assistance was given with these items when the child made an error, or hesitated unduly. During the test itself, the utterance was played, and the child was asked to repeat it. If the child did not repeat the utterance correctly, it was played again--several times if necessary. When the child had repeated the utterance correctly, he then repeated it again, tapping one chip for each word. Only this final repetition with tapping was scored.

As with Chappell and Karpova, our results showed that function words were more difficult to isolate than words that had more lexical

meaning. The most common error made by the children in our study was compounding a function word with the following content word.

Because we used a different methodology, and a greater variety of utterance types than did Chappell or presumably Karpova, our results are not directly comparable to theirs. The scoring system used in the different studies may not be comparable either. Thus, Karpova indicated that some children were able to syllabicate, as though this were a more difficult task than the isolation of lexical units. It is our impression that syllabication may well be an easier task for young children who are very responsive to the rhythmic qualities of language. In any case, our scoring penalized syllabications, and errors of this type accounted for between one-third and one-seventh of the total, depending on which version of our instrument was used. It also appeared that binary division between subject and predicate was a more common occurrence in the Karpova study than it was in ours, where it occurred less than one-third of one percent of the time in one group, and not at all in the others. This difference may reflect differences between the Russian and English languages.

In our study, awareness of small function words as free forms appeared to depend at least partially on the context in which the word was used. Thus, in the utterance, <u>You have to go home</u>, the word <u>to</u> is compounded by twelve of thirty-three children with <u>have</u> and by five of the thirty-three children with <u>go</u>. (See example 1 in Table 2.) In contrast, in the utterance, <u>The dog wanted to eat</u>, not one of twenty-four children compounded the <u>to</u> with <u>wanted</u>. (See example 1 in Table 2.) However, ten of the twenty-four children did compound <u>to</u> with <u>eat</u> in this sentence.

The children's handling of the word is also depended on how the word was used. When the word is was used as a copula in the sentence Snow is cold, twenty-three of twenty-seven children were able to isolate the is. (See example 2 in Table 2.) Even when the sentence is transformed to the interrogative, Is snow cold?, twenty-one of the twenty-seven children were successful in isolating the verb. However, within this same group of twenty-seven children, sixteen compounded the auxiliary is with the progressive form of the verb drinking in the sentence Bill is drinking soda. (See example 3 in Table 2.) When the sentence was transformed to the interrogative, seventeen of twenty-seven children were unable to isolate the auxiliary is: Is Bill/drinking/soda. (See example 3 in Table 2.) In Group II the same treatment of the auxiliary and the gerund occurred for this item as can be seen from example 4.

One may guess from this example that the child's sensitivity to the rhythmic aspects of an utterance may influence the way he segments it.

On almost every item where the word the appeared, more than half of the group compounded it with either the following or the preceding word. In the sentence Houses were built by the men, two children compounded the with the preposition by, whereas twelve children compounded it with the word men. (See example 5 in Table 2.) In the case of the two children who combined the with by, rather than with the following content word, the rhythmic pattern of the sentence may again have been an influence: Houses were built by the men. Whether some responses are in fact, based on rhythm, and what characteristics of the sentence, the child, and the experimental situation

increase the likelihood of such responses are questions that remain to be investigated.

In general, the greater the proportion of content words in an utterance, the greater the percentage of correct segmentations. The relationship is illustrated by the two similar utterances in example 6 of Table 2: The dog wanted bones, and The dog wanted to eat. The dog wanted bones was correctly segmented by only two children in a group of twenty-seven. An additional fifteen children did it correctly except for compounding the with dog. In the sentence The dog wanted to eat, one child segmented the entire sentence correctly. An additional seven segmented it correctly except for compounding the with dog. An additional nine children not only compounded the with dog, but also compounded to with eat. If only content words are considered, however, seventeen children segmented the sentence correctly in both instances.

Since the ability to isolate words apparently depends not only on the type of sentence and the word within the sentence but also on congruence of printed forms with linguistic ones, it does not seem very likely that illiterate persons of any age would be completely successful at identifying lexical units. Chappell and Karpova are undoubtedly correct in stressing developmental factors, but by the time a child is old enough to be in the first grade, the crucial factor in his ability to isolate lexical units in English, may well be simply the extent of his acquaintance with the conventional method of representing these units in written discourse. Our experience with the last version of instrument, when it was administered to a very small sample of able children at the end of the first grade, suggests that after a year of reading instruction such children make almost no errors. Although the

development of awareness proceeds from the global to more finely differentiated segments, future studies would do well to submit their scoring to linguistic definitions and to measure the performance of illiterate, adult native speakers. In this way we may learn if the illiterate adult does respond in a consistent and linguistically logical manner when segmenting a sentence or utterance into its lexical units, and if his performance is substantially different from that of the pre-literate child. This may help to clarify further the weight of the developmental factor in certain aspects of early language learning.

Because there is a discrepancy between the printing convention of written English and pre-literate children's intuitive identification of word boundaries, it is natural to ask if this discrepancy affects beginning reading performance. In order to begin an investigation of this question, 65 of our original 84 subjects were administered the New York State Readiness Test. This instrument consists of six subtests: word meaning, listening, matching, alphabet, numbers, and copying. Correlations between the three versions of our instrument and the Readiness scores, both subtest and total, were very low. In only one case was a correlation above .4 obtained.

The majority of reading readiness tests currently in wide use account for roughly one-third to one-half of the variation in end-of-first-year reading achievement scores. The last two versions of our instrument were quite reliable, and yet they had low correlations with the Readiness Test scores. Therefore a good correlation between scores on our instrument and first grade reading achievement scores would signal an additional helpful variable in predicting performance at beginning stages of reading. For these reasons we plan to relate

scores on our instrument to reading achievement scores at the end of this school year.

The nature of the variable we have investigated is quite different from those previously used to predict first grade reading achievement scores. We hope, therefore, that future research along these lines will contribute both to more accurate prediction and to greater theoretical understanding of the reading process.

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Table 1. Test Items

Items Administered to Group I (N = 33)

Sample: a) Two dolls. b) My funny dog. c) I like to eat candy.

Items:

1. Big red wagon.
2. She wanted a dog.
*3. Come here now children.
4. Red and green balloons.
***5. Give me mine.
***6. Pies were baked by mother.
7. Run away fast.***
8. Pretty pair of shoes.
9. Good for you.***
10. You have to go home.
11. The boy dresses himself.
12. John thought of it.*

Items Administered to Group II (N =24)

Samples: a) Two dolls. b) My funny dog. c) Big red wagon.

Items:

**1. Little blue chair.
***2. Give me mine.
**3. The dog wanted bones.
4. Children come here now.
5. Did John think of it?
6. Were the pies baked by mother?
**7. Bill is drinking soda.
***8. Pies were baked by mother.
9. Good for you.***
10. Run away fast.***
11. Away ran the horse.
12. The dog wanted to eat.
13. Mother baked pies.
14. Come here now children.*
15. Is Bill drinking soda?**
16. John thought of it.*

Items Administered to Group III (N = 27)

Samples: a) Two dolls. b) My funny dog. c) Big red wagon.

Items:

**1. Little blue chair.
***2. Give me mine.
**3. Is Bill drinking soda?
4. Is snow cold?
5. Is the brown dog funny?
6. Is Bob my friend?
7. Is the red ball the biggest?
***8. Pies were baked by mother.
9. Houses were built by the men.
**10. The dog wanted bones.
11. Good for you.***
12. Bill is drinking soda.**
13. Snow is cold.
14. The brown dog is funny.
15. Bob is my friend.
16. The children are in the house.
17. Run away fast.***
18. Are the children in the house?
19. The book is in the desk.
20. The red ball is the biggest.

* Common to Groups I and II.
** Common to Groups II and III.
*** Common to Groups I, II, and III.

Table 2. Examples of Response Patterns

Example	Group	Test Item and Responses	No. of Ss Giving the Response
1	I (N = 33)	Test Item: You have to go home.	
		Responses: You/haveto/go/home	12
		You/have/togo/home	5
	II (N = 24)	Test Item: The dog wanted to eat.	
		Responses: The/dog/wantedto/eat	0
		The/dog/wanted/toeat	10
2	III (N = 27)	Test Item: Snow is cold.	
		Response: Snow/is/cold	23
		Test Item: Is snow cold?	
		Response: Is/snow/cold	21
3	III (N = 27)	Test Item: Bill is drinking soda.	
		Response: Bill/isdrinking/soda	16
		Test Item: Is Bill drinking soda?	
		Response: IsBill/drinking/soda	17
4	II (N = 24)	Test Item: Bill is drinking soda.	
		Responses: Bill/isdrinking/soda	7
		Billis/drinking/soda	4
		Test Item: Is Bill drinking soda?	
		Response: IsBill/drinking/soda	16
5	III (N = 27)	Test Item: Houses were built by the men.	
		Responses: Houses/were/built/bythe/men	2
		Houses/were/built/by/themen	12

Examples of Response Patterns (Continued)

Example	Group	Test Item and Responses	No. of Ss Giving the Response
6	III (N = 27)	Test Item: The dog wanted bones.	
		Responses: The/dog/wanted/bones	2
		Thedog/wanted/bones	15
		Test Item: The dog wanted to eat.	
		Responses: The/dog/wanted/to/eat	1
		Thedog/wanted/to/eat	7
		Thedog/wanted/toeat	9

Note.--Various additional errors not discussed in the text are not shown.