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ABSTRACT

The responses of 108 children, aged five through nine, to the question, "What is reading?" were analyzed to determine whether there were age-related trends toward more mature and structurally more complex definitions of reading and whether a relationship existed between reading skill and the ability to formulate a definition of reading. The Reading subtest of the Wide Range Achievement Test (WRAT) was also administered to each child as a measure of reading skill. Results showed that there were differences by age and grade level in maturity of definition (as measured in terms of inclusion of critical elements of word recognition and meaning) and in structural complexity (as defined by number of facets of reading specified). A significant positive relationship was found between reading skill as measured by the WRAT and complexity of definition. These findings were supported in a second study involving 36 children in kindergarten through grade two and in a reanalysis of earlier research data. (RL)

WHAT IS READING? CHILDREN'S PERCEPTIONS

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ABSTRACT

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If perceptions of reading reflect the cognitive developmental patterns found for many other concepts, we would expect age-related changes during the elementary years in ability to select and coordinate critical aspects of a phenomenon. Responses of 108 children grades K-4 to the question "What is reading?" were analyzed.

Significant differences by age were found for Maturity (inclusion of critical elements of word recognition and meaning; (χ^2=10.39 (df 2); $p<.01$) and for Complexity (number of critical elements coordinated; (F=5.6 (df 2, 105); $p<.01$). Definitions categorized as No Response or Classroom Procedures decreased, while definitions categorized as Word Recognition or Meaning increased. Only 8 and 9 year olds mentioned both word recognition and meaning. A positive relationship was found between decoding skill and complexity of reading definitions (χ^2=21.22 (df 2); $p<.01$). Results from 2 other studies are reported.

The conceptualization of reading as a cognitive developmental process appears useful, and does not rule out possible instructional effects.

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There is general acceptance of the idea that reading and thinking are related, yet there are several very different kinds of relationships that are assumed or tested, and these differences are not always made explicit. Most common is a model in which thinking is viewed as a general foundation for reading. This is often operationalized as testing intellectual prerequisites or correlates of reading achievement in research studies (Bond and Wagner, 1955), or as measures of readiness or reading expectancy in clinical investigations (Bond and Tinker, 1973).

A second model focuses on the cognitive demands of reading materials. Especially at higher levels of reading, it becomes obvious that full understanding of the meaning and implications of reading material often requires certain cognitive skills and abilities such as sequencing, cause-and-effect relations, ability to coordinate information from several sources, ability to deal with larger units of information, and ability to infer relationships not directly stated.

A third, less familiar model is one which considers that an important aspect of cognitive development is the development of concepts about reading and language. Research on concepts about words (Papandropoulou and Sinclair, 1974); sentences (Beilin, 1975; Hutson, 1977); printed words (Kingston, Weaver and Figa, 1971); sounds (Read, 1971; Johns, 1975); and the nature of reading

(Downing, 1969; Hutson & Green, 1978) indicates that there are developmental trends in concepts about language and reading. There is at this time, however, little awareness of this body of literature on the part of practitioners in classroom, clinics, and teacher-training institutes, though many who closely observe students are intuitively aware that problems arise not only from students' lack of skill but from their lack of understanding of the reading process and of their own roles as readers.

Although each model of the relationship of conceptual development and reading can contribute to our understanding, the third model, focusing on concepts about reading, has broad implications and deserves fuller exploration. Downing (1969, p. 217) stated that "children's thoughts about reading, their notions or conceptions of its purpose and nature, present the most fundamental and significant problems for the teacher of reading." It is for this reason that this discussion will focus on children's concepts about reading, as reflected in the definitions they give for reading.

Previous Studies: There have been a number of studies in which children were asked "What is reading?" These studies differ in terms of theoretical orientation, categorization systems, degree of focus on age-related changes, and type of statistical analysis performed.

Downing (1969) interviewed thirteen five year olds in England and compared their responses to those reported by Reid (1966). He did not report how the responses were analyzed but gave examples and described some major changes in children's

thinking as they move from confusion to cognitive clarity about the communicative purpose of written language. He indicated that growth in awareness of the communicative purposes of language is associated with increased ability in reading and writing.

A cognitive developmental perspective was not emphasized by other investigators, who have typically focused on description of general types of responses rather than on linking this area to general cognitive development. In one of the earlier studies, Weintraub and Denny (1965) asked first graders "What is reading?" They reported that 27% gave vague, circular or "I don't know" responses, 33% gave object related responses such as: "To read a newspaper," i.e. the answer included reading in relationship to the material to be read. Six percent gave expectation responses like "It's something that you have to learn how to do." None of the above kinds of responses can be viewed as central aspects of the reading process. Weintraub and Denny further reported that 6% gave a mechanical description of reading (for example, "It's words and you sound them out if you don't know them") which emphasized reading as word recognition. Finally, they reported that 20% of the children described reading as a cognitive act: "Reading is how to learn things." This category seems to be for responses which view reading as a means of deriving meaning, though the example given seems rather vague.

Tovey (1976) investigated the conceptions of reading held by 30 children in the first through sixth grades. In response to the question "What do you think you do when you read?" he reported 29% described reading as spelling, talking, memorizing

and so on, which seems roughly to include immature definitions; 43% described reading as pronouncing, thinking of words, etc., which seems to be a category of viewing reading as word recognition, and 28% indicated that reading has something to do with meaning. Tovey did not report analysis of age related differences since he interviewed only five students at each grade level.

Johns and Ellis (1975) asked children in grades one through eight "What is reading?" They reported the following percentages of responses: (1) No response, vague or circular (14%); (2) Classroom procedures or educational value (22%); (3) Word recognition (56%); (4) Meaning or understanding (3%); (5) word recognition and meaning (5%). The first two categories were considered to be non-meaningful and the last three categories meaningful. Responses in category five would indicate a synthesis of the decoding and meaning aspects of reading, but such responses were rare. Though Johns and Ellis interviewed a large number of children in eight grade levels, their analysis did not focus on age/grade differences. They characterized developmental changes only stating that "older students have a somewhat better understanding of the reading process than younger students." (Johns and Ellis, 1975, p. 12).

Johns (1974) also investigated the conceptions of reading held by good and poor readers. Using the grade equivalent scores of 103 fourth and fifth graders from the Gates MacGinitie comprehension subtest, 36 students who scored at least one year above grade level were classified as "good readers" and twenty-nine students who scored at least one year below grade level on the same test were classified as "poor readers." These students were asked "What is

reading?" Using the same categorization system as in the study described above, the findings tended to support the hypothesis that a significantly greater number of meaningful definitions of reading (categories 3-5) were given by good readers. More than half the good readers, however, gave definitions classified as non-meaningful.

Several of these studies conclude that children have inadequate conceptions of the reading process and indicate that the instructional program is the cause.

Weintraub and Denny concluded that there is a "need for teaching to be directed toward aiding children to think of reading as a thinking, meaningful act." (p. 327) Tovey interpreted the children's responses as implying that teachers, and consequently their students, use the "word recognition equals reading" model. Johns and Ellis, too, indict the instructional program by writing: "It may be that teachers are over-emphasizing decoding or 'sounding out' strategies to the exclusion of the role meaning plays in reading." (1975, p. 12)

The Need: These studies have established that there are differences in definitions given for reading. Most studies have not emphasized age-related changes. There is relatively little direct information about relationships between definitions and other behaviors or beliefs related to reading. The studies, reviewed, except for Downing's, have not been anchored in a cognitive developmental framework and have not made full use of the guidance that such an orientation might give in analyzing and interpreting data. In addition, even when sample sizes were large, analysis

has tended to be rather informal, limited to nominal data that does not easily lend itself to more powerful statistical treatment.

In the series of studies to be presented here, definitions of reading were viewed as an aspect of cognitive development.

This point of view implies that children's beliefs and understandings about the nature of reading may be influential in directing their strategies and skills. Just as children's concepts about physical and quantitative aspects of the world show growth and reorganization over the elementary years, there is evidence that their concepts about many other aspects of the world such as interpersonal relationships (Flavell 1968) and language structures also show changes over this period. For example, Papandropoulou and Sinclair (1974) found that children's metalinguistic comptence (as seen in their responses to questions such as "What is a word?") develops along lines similar to those found for the general cognitive structures described by Piaget.

A cognitive developmental framework applied to reading would examine developmental changes in the types of concepts children have about reading, asking, "Are there age-related changes in children's ability to select critical aspects of reading and to coordinate several aspects? Are such changes related to other aspects of children's behavior or understanding?" Finding such developmental changes would not rule out environmental forces such as instructional programs, but would instead give a clearer background against which to examine the effect of teaching practices and their interaction with students' levels of development of concepts about reading. The series of studies presented here

focused primarily on developmental patterns, with only incidental information about the programs in which students were involved.

A developmental focus was reflected not just in the questions asked of the subjects but in the questions asked of the data, investigating the ways in which children express and coordinate their concepts about reading. This, in turn, suggested more powerful statistical analyses that allowed testing of trends in the development of concepts about reading, as reflected in definitions. In addition, the studies included a measure of reading skill, making it possible to test certain relationships between reading skills and concepts of reading.

If definitions reflect development of concepts about reading, it would be expected that there would be (a) age-related changes in tendency to include critical elements (word recognition and meaning) in definitions; (b) age-related changes in ability to specify the coordination of elements or facets of a phenomenon (in this case, to recognize that a fully adequate definition of reading should include both word recognition and derivation of meaning); and (c) at least a moderate relationship between concept development and achievement.

These are the central research questions tested in these studies:

1. Is there a significant difference by age levels in mean scores for maturity of reading definitions (inclusion of critical elements)?

2. Is there a significant difference by age levels in mean scores for complexity of reading definitions (coordination of facets)?

3. Is there a positive relationship between reading skill (WRAT scores) and complexity of reading definitions?

STUDY I

METHODS

Sample: From a university laboratory school serving a wide-ranging, predominantly middle-class, professional population, 103 children ages 5-9 were individually tested.

Procedures: Each child was interviewed with the question, "What is reading?" Responses were written by the interviewer. The Reading subtest of the Wide Range Achievement Test (Jastak, 1965) was also administered individually to each child.

Classification and Scoring: Categorization of definitions was done at three hierarchically related levels, moving from global to fine-grained analyses. The most global level was to classify definitions as Mature or Immature, on the assumption that a mature definition would include reference to either meaning or word recognition or both. (Johns and Ellis, [1975] used for this level the terms meaningful and non-meaningful, but responses in the classroom procedures category seem not so much non-meaningful as a lower level of meaning, since major concepts seldom appear for the first time in full-blown form).

The next level of analysis was to sort the definitions into more specific sub-categories. Under Immature definitions the two subcategories were No Response and Classroom Procedures. (For more detail, see Table 1). Under Mature definitions, the three subcategories were Word Recognition, Meaning, and Word Recognition and Meaning. In addition to assessing frequencies of responses across these subcategories, it was possible derive a weighted score for structural complexity of definition: 0 for

either of the Immature subcategories, 1 for either of the Mature subcategories referring to one facet of reading (either Word Recognition or Meaning), and 2 for a Mature definition including both of these facets.

The third level of categorization was a more detailed analysis of types of definitions within the Word Recognition and Word Recognition and Meaning subcategories in terms of reference to sounds, words, sentences and their relationships. (Qualitative analysis of this type was also conducted within the other Mature subcategories, but since children showed very few responses in these categories, that analysis will not be presented here.)

The Reading subtest of the Wide Range Achievement Test or WRAT was used as a measure of reading skill and scored in the standard manner (Jastak, 1965). Based on the number of words read in isolation, the test yields an estimate of instructional reading level.

Design: Most of the analysis in Study 1 consisted of description of frequency distributions across categories for three age levels - preschool (5-year olds, n=22), primary (6 and 7 year olds, n=49), and intermediate readers (8 and 9 year olds, n=37). Chi square analysis was computed testing differences in proportions of mature definitions at three age levels. Unweighted means analysis was conducted for the differences in mean weighted scores for structural complexity (faceting) of definitions of reading given by the three age groups. The relationship between reading skill and complexity of reading definition was analyzed by Chi square analysis.

RESULTS

DEFINITIONS OF READING

Answers to the question, "What is reading?" were first classified by means of a modified version of the categories described by Johns (1974), and then by other increasingly fine-grained analyses. The modification presented here yields a three-level hierarchical system for analysis moving from global to fine-grained analysis.

Maturity of Definitions: The first analysis examined maturity of definitions of reading. As seen in Table 2, percentage of Immature responses decreased by grade level. Responses of 82% of the kindergarteners were deemed immature. This percentage declined to 69% at age 6-7 and 43% at ages 8-9. (In contrast, none of the responses of graduate students entering a program in reading specialization in a related study [Green, et al., 1978] were categorized as immature.)

(Insert Table 2 and Figure 1 about here)

Mature responses dealing with one facet of the reading process (either word recognition or meaning) increased by grade level, from 18% for 5-year olds to 31% for 6-7 year olds and 43% for 8-9 year olds. None of the children aged 5-years old or 6-7 years old gave two faceted definitions specifying both word recognition and meaning, while 14% of the definitions of reading spontaneously provided by 8-9 year olds were mature definitions referring to both word recognition and meaning. Combining the two mature categories, the percentages of mature definitions were 18% for 5-year olds, 31% for 6-7 year olds and 57% for 8-9 year olds. The difference in

these proportions indicates age level and maturity of definitions [χ^2= 10.3896 (df 2); $p<.01$] are not independent.

Complexity of Definitions: Another means of analyzing maturity of definitions was based on mean weighted scores for the structural complexity of definitions. Immature responses were scored as 0, Mature responses with one facet (either word recognition or meaning) were scored as 1, and Mature responses with two facets (both word recognition and meaning) were scored as 2. Mean weighted scores increased across age levels. With a maximum possible score of 2.0, group means ranged from 0.36 for 5-year olds to 0.31 for 6-7 year olds to 0.70 for 8-9 year olds, with the largest increment from the 8-year olds to the 9-year olds.

One-way unweighted means analysis on weighted scores for complexity yielded a significant effect for Age level ($F=5.6$ (df 2, 105); $p<.01$). Scores for children at ages 8-9 were significantly higher than those for younger children.

(The mean for a group of adults entering a graduate program in reading specialization (Green et al., 1978) is still higher, indicating the direction of the developmental course.).

Types of Definitions: For the second level of analysis, definitions were sorted into five subcategories. Table 3 and Figure 2 provide a more detailed view of the distribution of definitions across the subcategories. The percentage of No Response or Don't Know responses decreased from 45% at age 5 to 27% at ages 8-9. Definitions in terms of Classroom Procedures, the concrete features and activities associated with reading, declined from 36% at kindergarten to 16% at ages 8-9.

The only mature definitions given spontaneously by kindergarteners were Word Recognition definitions given by 18% of the 5-year olds. Responses in this category increased to 27% for 6-7 year olds and 32% for 8-9 year olds.

(Insert Table 3 and Figure 2 about here)

None of the 5-year olds and only one of the 6-7 year olds defined reading as Meaning, but 11% of the 8-9 year olds defined reading as Meaning alone and an additional 14% specified both Meaning and Word Recognition.

Relationships between Sounds, Words, and Sentences: One of the definition categories, Word Recognition, was subjected to a finer breakdown for qualitative analysis. Three types of response were observed in the subcategory: (a) unspecific reference to reading as word recognition; (b) reference to a relationship between words and their component sounds or letters; (c) reference to a relationship between words and the sentences or passages in which they were embedded. The percentages given in Table 4 are based not upon all subjects at each age level, but upon all of the children at each age level who gave a Word Recognition or Word Recognition and Meaning definition for reading. The numbers are relatively small (a total of 34 children) and must for that reason be interpreted cautiously, but the results are of interest.

(Insert Table 4 about here)

Of the four kindergarteners who gave definitions of reading referring to word recognition, all gave unspecific reference to word recognition. The percentage of unspecific word recognition definitions falling into this subcategory declined from 100% for 5-year olds to 62% for 6-7 year olds to 53% for 8-9 year olds. Reference to the relationship

of word to sound or letter increased from 0% at kindergarten to 30% for 6-9 year olds who defined reading in terms of word recognition. Reference to the relationship of word to sentence was given by one child in the 6-7 year old group and three of the children in the 8-9 year old group (18%).

RELATIONSHIP BETWEEN READING SKILL AND READING DEFINITION

As seen in Table 5, there is a relationship between reading skill (WRAT scores) and complexity of reading definition (χ^2=21.22 (df 2); $p < .01$). Of the children who gave Immature reading definitions (e.g., no response, a circular definition, affective responses, vague, or referring to classroom procedures or objects related to reading), 72% had reading scores below fourth grade. Of those who gave a Mature definition with one facet (either word recognition or meaning), 36% were below fourth grade in reading skill and 64% read at or above the fourth grade instructional level, as assessed by the Wide Range Achievement Test. Of the 7 children who gave a Mature two-faceted definition, all read at or above 4th grade level. While a certain level of skill in reading may be necessary or at least facilitative in a child's formulation of concepts about reading, (decoding) skill level does not appear to be sufficient for a fully balanced definition of reading. Children with reading ability above fourth grade level gave 28% of the Immature definitions and 64% of the Mature one-faceted definitions.

STUDY 2

In Study 2 the procedures were similar to those in Study 1. From a public school serving middle class and lower-middle class families, 36 children in grades K-2 were tested.

Unweighted means analysis was conducted for differences between two age levels, preschool(kindergarteners, n=12) and primary (first and second graders, n=24).

In this study, as in Study 1, a significant relationship was found for age level and maturity of definitions (x^2=5.58 (df 1); $p<.05$). Mature definitions were given by 25% of the kindergarteners and by 67% of the first and second graders. Though the overall direction of growth was similar to that found in Study 1, the percentage of mature definitions given by 6-7 year olds (particularly the 7-year olds) was higher than in Study 1.

None of the 5 year olds and only one of the 6-7 year olds gave mature definitions with two facets. This finding is consistent with the findings of Study 1.

STUDY 3

A study by Johns and Ellis (1975) reported raw frequency data by grade levels for the five subcategories of reading definitions used in the present series of studies. Percentages, however, were listed only for the total sample of grades one through eight. In order to compare his results with those found in the present series, his ras response data were converted to percentages and to weighted scores for maturity.

Over the range of grades one through four, which matched those sampled in Study 1, there is no significant difference in frequency of mature definitions by grade level (x^2=1.76, (df 1); NS) in Johns and Ellis' data (Table 6). The means for grades one and two and for

grades three and four were quite similar. They were in fact similar to the mean scores for maturity of definition for grades 5 and 6. It was only at grades 7 and 8 that a real change to greater frequency of mature responses was apparent. Even at that level, however, there were very few responses referring to meaning. Even at that level, however, there were very few responses referring to meaning.

Differences by age/grade level found in Study 1 were not found in re-analysis of Johns and Ellis' data for grades 1-4 but the same trend seems apparent later, in grades 7 and 8.

SUMMARY

The primary purposes of Studies 1 and 2 were to determine whether there were age-related trends toward more mature and structurally more complex definitions of reading, and whether there was a relationship between reading skill and ability to formulate a definition of reading. It was found that there were differences by age/grade level during the early elementary years in maturity of definitions, as measured in terms of inclusion of critical elements of word recognition and meaning, and in structural complexity, as defined by number of facets of reading specified. Reanalysis of Johns and Ellis' (1975) data shows that while differences were not found in the elementary grades, there was an apparent change in this direction at grades seven and eight.

There was also a significant positive relationship found in Study 1 between reading skill as measured by the Wide Range Achievement Test and complexity of definitions. Only children

with reading skill above fourth grade level gave two-faceted definitions. This finding is consistent with that of Johns and Ellis (1975), although the means of assessing reading status differed.

Qualitative analysis of definitions categorized as Word Recognition suggested a movement from (1) focus on the words themselves (or on the letter sounds alone) to (2) focus on the relationship between words and their component letters or sounds, to (3) focus on the relationship between words and sentences, mentioned only by a few of the older students. This aspect of the analysis was based upon responses of a smaller number of children in Study 1 and is offered not as definitive but suggestive of a approach useful in further investigation.

The results of this investigation demonstrate the usefulness of conceptualizing reading as a cognitive phenomenon and eliciting definitions of reading as a means of tapping concepts about reading. There are, however, a number of limitations to this study: (1) since formulation of a verbal statement about a concept is typically more demanding than intuitive use of the concepts, the estimates of conceptual development reported here may be conservative estimates; (2) the definitions given by children were not probed except to encourage them to respond or to ask whether there was anything else they would like to add (this is an effective means of obtaining spontaneous responses but may underestimate children's ability to give greater specification under closer questioning); (3) the Wide Range Achievement Test, though widely used and highly correlated with other measures of reading ability, does not directly assess reading of connected discourse and does not allow observation

of the strategies children use in processing text; (4) the full age range over which concepts about reading develop is not spanned in the present study, though results obtained in a related study of three groups of adults (Green et al., 1978) [illegible] verification of the direction of developmental trends, but there may well be differences related to reading status or to manner of instruction. In Study 2, for example, the second graders' relatively early mention of meaning in reading may have been influenced by their teachers' emphasis on meaning. These issues deserve fuller exploration but do not detract from the findings reported.

In summary, there appear to be developmental trends in children's ability to define reading, reflected in increasing tendency to refer to critical aspects such as word recognition and meaning, and in specification of the complexity of coordination of these elements. The timing and final form of such developmental changes, however, may well be influenced by children's background and the instructional emphasis they receive.

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TABLE 1

Categories Used at Three Levels of Analysis of Definitions of Reading

1	IMMATURE			MATURE		
2	No Response	Classroom Procedures		Word Recognition	Meaning	Word Recognition and Meaning
3	Types of Word Recognition: a. Words - unspecific b. Words in relation to letters/sounds c. Words in relation to sentences					

TABLE 2

What is Reading?

Distribution of Responses across Categories

	N	Immature 1-2	Mature One facet 3-4	Mature Two facet 5
5 years	(22)	82%	18%	0%
6-7 years	(49)	69%	31%	0%
8-9 years	(37)	43%	43%	14%

TABLE 3

Percentage of Definitions in Each Subcategory at Each Age Level

	N	1 No Response	2 Classroom Procedures	3 Word Recognition	4 Meaning	5 Word Recognit. and Meaning
years	(22)	45%	36%	18%	0%	0%
7 years	(49)	37%	33%	27%	4%	0%
9 years	(37)	27%	16%	32%	11%	14%

TABLE 4

Frequency of Various Types of Word Recognition Responses

	N	Words General	Words in Relation to Sounds/Letters	Words in Relation to Sentences
5 years	(4)	100%	0%	0%
6-7 years	(13)	62%	31%	8%
8-9 years	(17)	53%	29%	18%
TOTAL	(34)			

TABLE 5

Relationship Between Reading Skill and Complexity of Definition
Definition of Reading-Weighted Score for Complexity

Reading Level	n	0	1	2
Below 4th grade	(61)	72%	36%	0%
4th grade or higher	(47)	28%	64%	100%
n=	(108)	(68)	(33)	(7)

TABLE 6

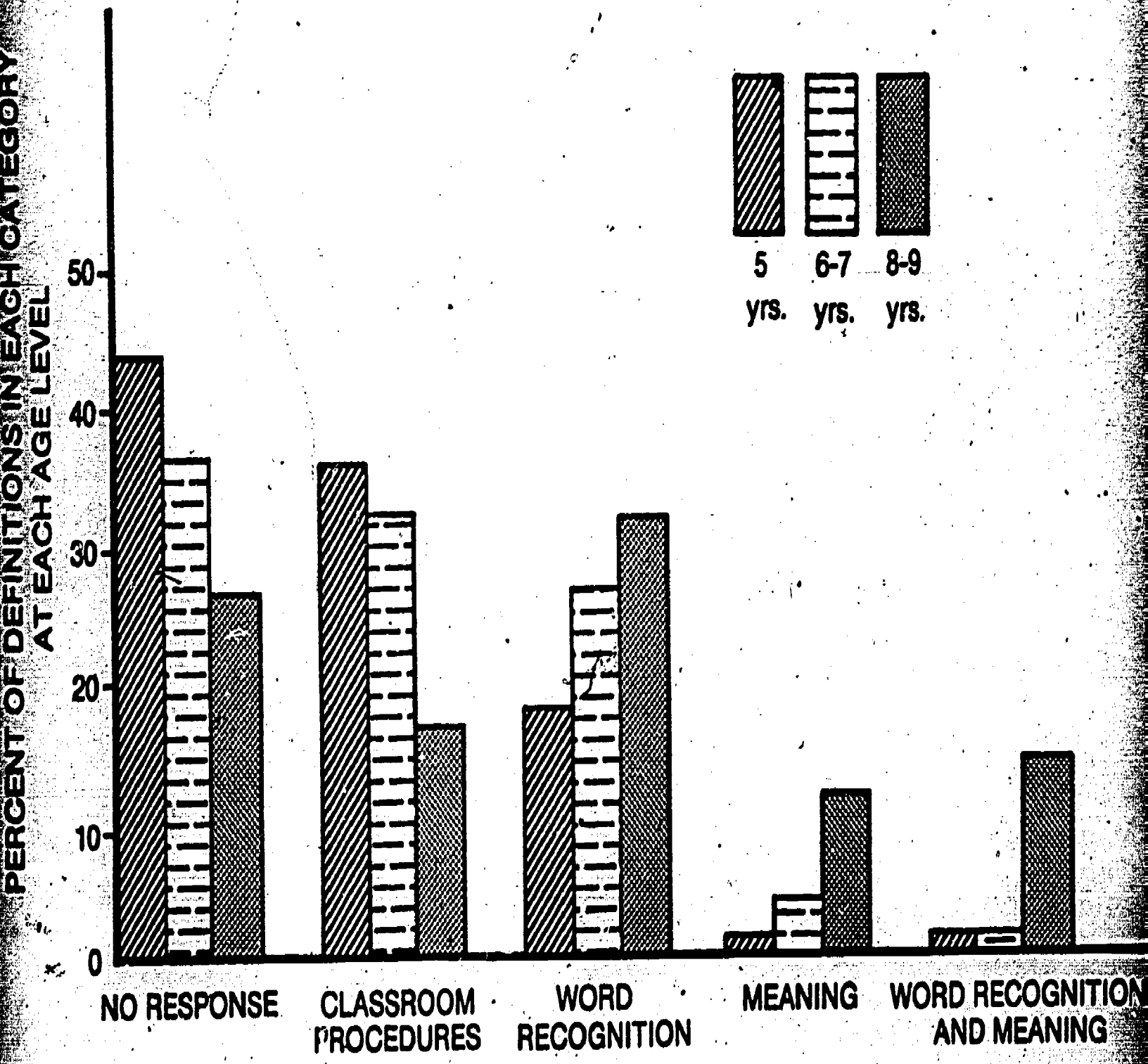
Percentage of Definitions in Each Subcategory at Each Grade Level in Johns and Ellis' Data

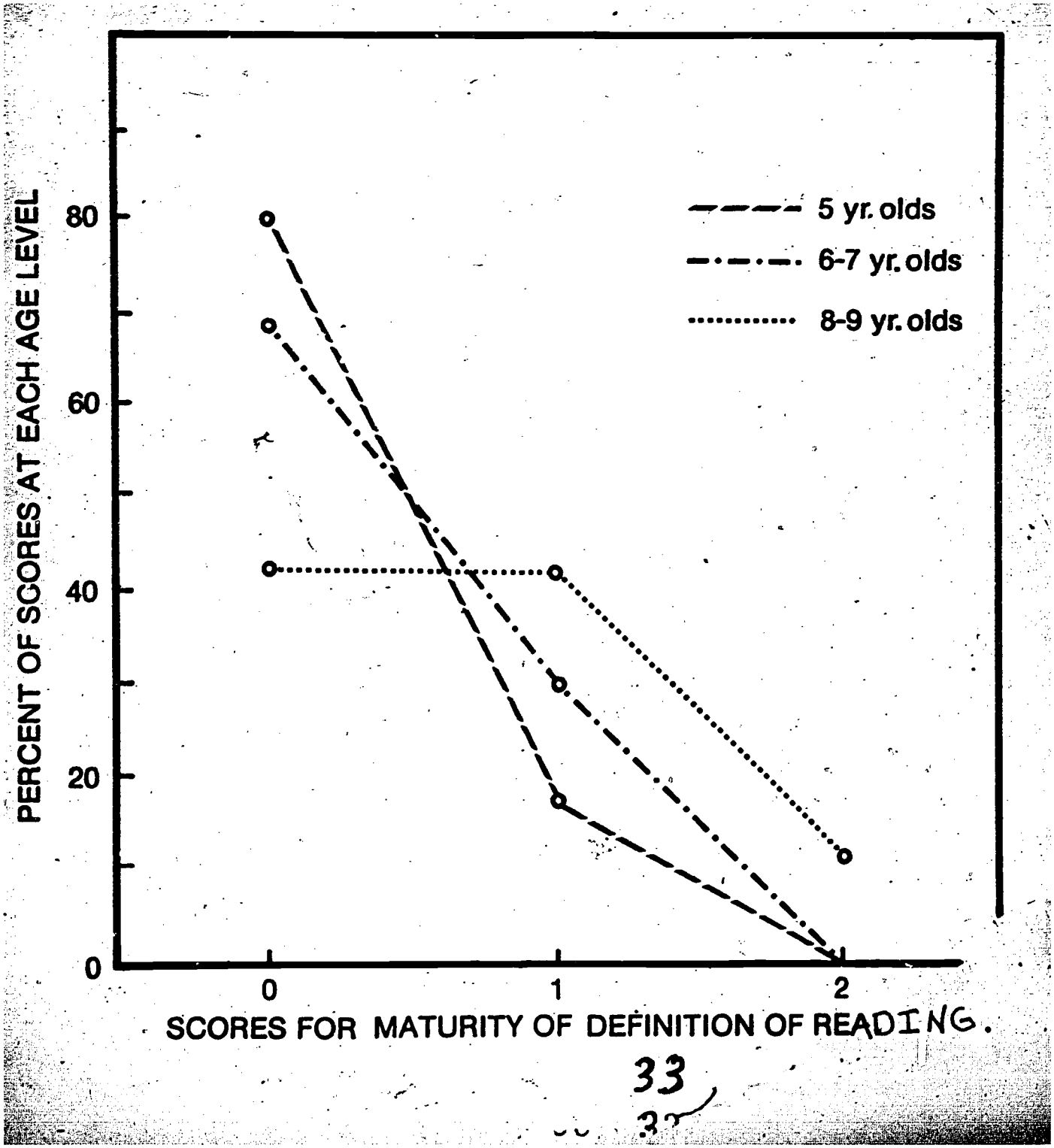
		IMMATURE			MATURE	
		1	2	3	4	5
	N	No Response	Classroom Procedures	Word Recognition	Meaning	Word Recognition and Meaning
Grades 1 & 2	(427)	49%	33%	17%	1%	0%
Grades 3 & 4	(453)	36%	41%	15%	6%	2%
Grades 5 & 6	(363)	36%	46%	12%	4%	3%
Grades 7 & 8	(533)	20%	30%	17%	21%	12%

FIGURE CAPTIONS

Figure 1 Mean Scores for Maturity of Definition of Reading at Each Age Level

Figure 2 Percent of Definitions of Reading in Each Category at Each Age Level


PERCENT OF DEFINITIONS IN EACH CATEGORY AT EACH AGE LEVEL
50
40
30
20
10
0
5 yrs.
6-7 yrs.
8-9 yrs.
NO RESPONSE
CLASSROOM PROCEDURES
WORD RECOGNITION
MEANING
WORD RECOGNITION AND MEANING


5 yr. olds
6-7 yr. olds
8-9 yr. olds
PERCENT OF SCORES AT EACH AGE LEVEL
80
60
40
20
0
0
1
2
SCORES FOR MATURITY OF DEFINITION OF READING.