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A RE-EXAMINATION OF THE I R I : WORD RECOGNITION CRITERIA

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A persistent yet unresolved question about the informal reading inventory (IRI) is, "What word recognition criterion and comprehension criterion are appropriate for identifying instructional reading levels of elementary students?" The fact that identification of appropriate recognition of words and comprehension criteria have not received wide attention by researchers is surprising, in view of its importance for the placement of students in reading material that will insure optimum progress in reading.

Killgallon's study in 1942 seems to have been the first to assign specific criteria for defining the instructional reading level: 95% word recognition accuracy and 75% comprehension accuracy (cited in Beldin, 1970). These criteria were probably identified by Betts (cited in Pikulski & Shanahan, 1982).

In 1952, Cooper studied the Betts criteria by measuring the progress of students. He concluded that the word recognition level for primary level students should be 98% and the comprehension level should 70%. However, for intermediate level, he found that word recognition should be 96% and comprehension 60%. He indicated that with more stringent criteria children progress more rapidly in reading.

Powell (1970) reported that younger children in grades 1 and 2 could tolerate a 15% error rate in word recognition and still maintain a comprehension level of 70%, while students at the intermediate level could tolerate only a 5% word recognition error rate to maintain a 70% comprehension level.

Hays (1975) used second and fifth grade students to determine word recognition criteria. He reported that students at these levels need to achieve a word recognition performance of at least 98% or 99% in order to have a comprehension score of at least 70%.

Both Powell (1970) and Cooper (1952) suggested that the word recognition criteria should be differentiated between primary and intermediate level students. However, Hays and Betts did not suggest such a differentiation. Jongsma and Jongsma (1981) examined 11 different IRI's (all but one were published after 1977) and found that only three inventories had varied the criteria with different grade levels.

Since there was no agreement among researchers about what are appropriate word recognition and comprehension criteria and because there was a lack of agreement as to whether the criteria should be the same for all elementary levels, additional research was apparently needed to resolve the issue of what constitutes appropriate criteria for IRI's:

1. 85% word recognition for grades 1 and 2 (Powell, 1970).
2. 98% word recognition for grades 1 through 3 (Cooper 1952).
3. 96% word recognition for grades 3 through 6 (Powell 1970).
4. 96% word recognition for grades 4 through 6 (Powell 1952).
5. 95% word recognition for all elementary levels (1 through 6) (Betts as cited in Beldin, 1970).
6. 98% or 99% word recognition for all elementary levels (Hays, 1975).

Procedure

One hundred and fifty students in Hillsborough County, Florida, were participants in the study. Three schools were selected because they had students who represented a variety of socioeconomic levels and intellectual abilities. At each school 50 students, 10 at each grade level from 1 through 5, were randomly selected for involvement in the study. If a student did not obtain a comprehension score of 70% on any passage, another student was selected as a replacement. However, of this number, some subjects were eliminated because final evaluation of the comprehension questions placed them below a 70% comprehension level.

The two researchers and a grad student administered the Analytical Reading Inventory (ARI)(Woods & Moe, 1981) to all participants in the study. Furthermore, 50 of the original subjects were randomly selected, 10 at each grade level, and given the Diagnostic Reading Scales (DRS) (Spache, 1981). Miscues, including substitutions, omissions

additions, teacher aid, and reversals, were coded as each student read. Consistent with Powell's (1970) procedure, repetitions were not included. In addition, oral reading and comprehension responses were taped for later verification.

The oral reading coding of miscues and the comprehension scoring of the grad assistant were checked by the researchers. Transcribed comprehension responses facilitated independent scoring by the researchers to determine agreement. Disagreement about the accuracy of a response was resolved through discussion.

Results

The percentage of agreement was used to determine the interscorer reliability of the researchers' scoring of the comprehension questions. Strong interscorer reliability, 97% to 98%, was found for the DRS and for Forms A and B of the ARI. However, on Form C of the ARI the interscorer reliability declined to 88%, which may indicate a lack of parallel form reliability.

To determine the number of word recognition errors students could tolerate and still maintain 70% comprehension, each student's protocol was scanned. Word recognition scores corresponding to a comprehension level of 70% or better were used for analysis. If a student had more than one comprehension score at the 70% or above level, the word recognition score for each of the acceptable comprehension levels was used. Subsequently, comprehension was held constant at 60% to determine the amount of change in error rate when a more lenient comprehension criterion was used.

The data in Table 1 show the mean percent of word recognition performance attained while comprehension was held constant at 70%. The word recognition performances for grades 1-6 on all three ARI forms are reported. The percentage of allowable word recognition errors ranged from 94% to 97%. While grade level differences in word recognition errors were apparent, a steady or consistent increase or decrease by grade level was not found. On the average, at no grade level could students tolerate less than 94% word recognition performance and still maintain 70% comprehension.

When comprehension was held constant at 60%, the anticipated lower error rate did not occur. There was little or no change in the acceptable word recognition

Table 1
The Analytical Reading Inventory
Means by Passage Level

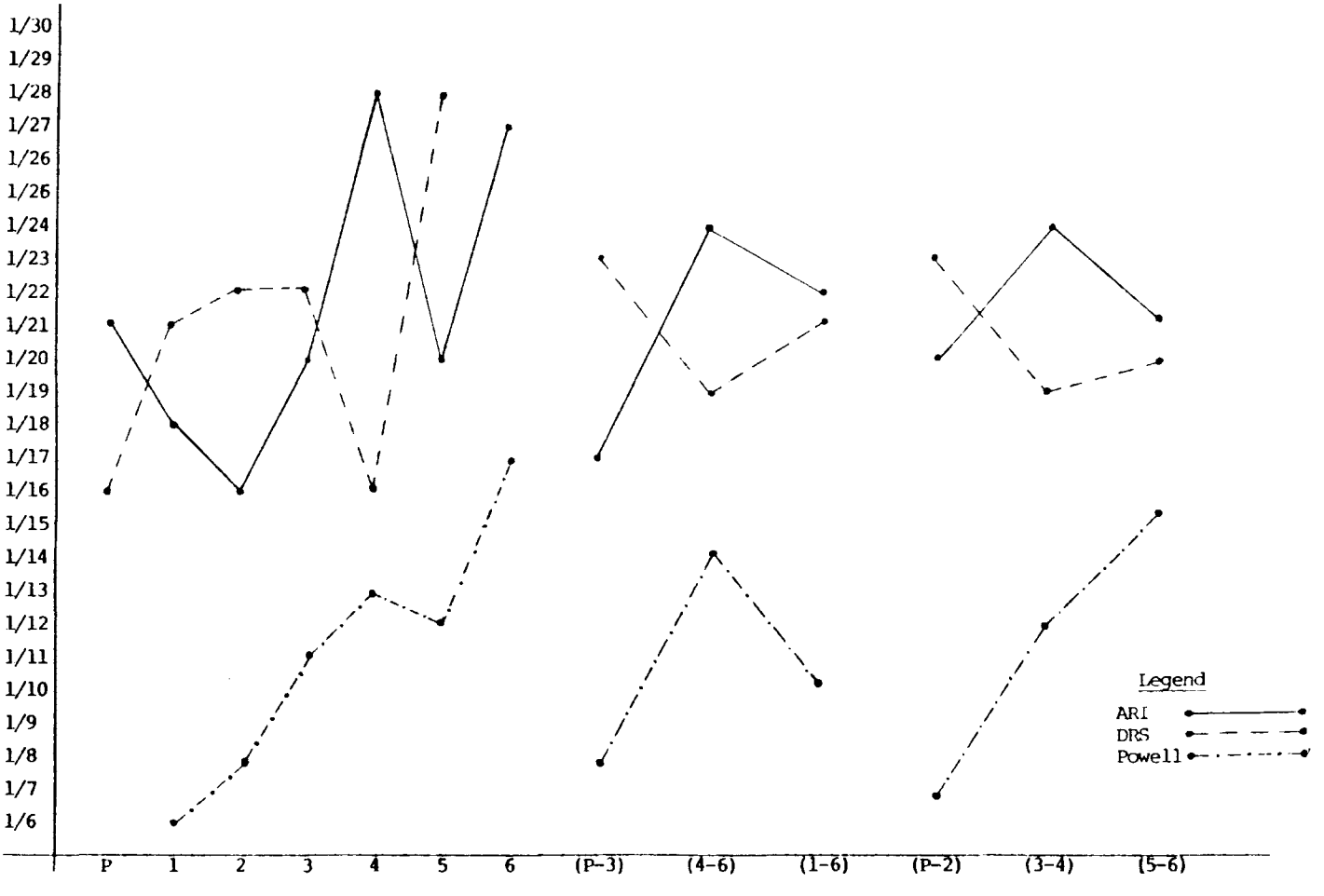
WWP	Passage	N	Mean	Ratio	Percent Word Recog.
50	P	27	2.4	(1/21)	95.23%
77	1	21	4.3	(1/18)	94.44%
115	2	25	7.1	(1/16)	93.75%
143	3	18	7.3	(1/20)	95.00%
144	4	24	5.2	(1/28)	96.42%
186	5	27	9.4	(1/20)	95.00%
189	6	13	7.0	(1/27)	96.29%

WWP=Words per passage.

error rate. Furthermore, the direction of the change was not always consistent.

Figure 1 depicts the average word recognition error rates for 70% comprehension at each grade level and for various grade level combinations for all three forms of the ARI and the DRS. In addition, the dotted lines represent the results of Powell's (1970) criteria study also presented for comparison. The lack of any consistent word recognition error pattern between instructional levels for different IRI's is apparent. The need for a more stringent word recognition criterion as children progress at the elementary level is strongly indicated in Powell's study. However, the results of the present study using the ARI and DRS indicate that there is some question about whether more stringent word recognition criteria are needed at the intermediate levels. In addition, the results of this studyindicate the need for a more stringent word recognition criterion for grades 1 and 2 than Powell found. In other words, the Betts formula seems appropriate for all levels.

Due to the lack of consistency between the word recognition error rate within each IRI, as well as unexpected large differences in results between IRI's, the investigators reexamined the passage level results in each form of the ARI and DRS. The analysis by passage raised further questions. One would expect to derive a word recognition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(P-3)
(4-6)
(1-6)
(P-2)
(3-4)
(5-6)
Legend
ARI
DRS
Powell

error rate that hovers around 5% for all passages as was found by Betts and supported by mean word recognition errors in the present study. The researchers were surprised by the wide range of error rate for different passages at any given grade level. This range seemed unrelated to the particular IRI used.

Table 2
Word Recognition Error Ratios by Passage Level

	P	1.6	1.8	2.2	2.4	2.8	3.5	4.5	5.5	6
Form A	1/50	1/20			1/24		1/32	1/28	1/15	1/18
Form B	1/19	1/28			1/21		1/9	1/35	1/30	1/47
Form C	0	1/16			1/11		1/34	1/27	1/38	1/29
ARI	1/21	1/18			1/16		1/20	1/28	1/20	1/27
r	-	-	1/32	1/54	1/49	1/40	1/25	1/18	1/21	-
s	1/16	1/35	1/13	1/14	1/11	1/29	1/20	1/13	1/83	-
DRS	1/16	1/21			1/22		1/22	1/16	1/28	-

Table 2 depicts the word recognition error ratio for each passage of the three forms of the ARI as well as the two forms of the DRS. While the mean word recognition criterion consistently was around the 5% error range, the disparity of word recognition error ratio used to derive that mean indicated a much greater passage-to-passage variation than anticipated. For example, at the 3.5 passage level, the ratio of word recognition errors which could be tolerated while maintaining 70% comprehension ranged from a low of 1 error for every 9 words (typically considered frustration level by the Betts and Powell criterion) to a high of 1 mistake in every 34 words (typically considered independent level for both the Betts and Powell criterion).

Conclusions

The purpose of this study was to resolve the question of which word recognition criterion is most appropriate for determining the instructional reading level for elementary students. The researchers utilized a method similar to that used by Powell (1970) to study this issue. However, the following changes were made:

1. Students representing a range of reading and

ability levels were included in the study rather than only average children.

2. Word recognition data from all instructional levels (70% comprehension) of a student were included in the analysis rather than only the level of highest word recognition performance.

3. All forms of two different IRI's were used to determine the effect of the inventory rather than using only one form of a single inventory.

The initial results of this study confirm previous research findings by Killgallon (cited in Beldin, 1970) strongly indicating that the word recognition criterion for instructional reading level should be set at about 95% for students reading at grade levels 1 through 6. However, a more in-depth analysis of the data revealed that word recognition criteria may be variable, depending upon any number of factors which could include readability, concept density, type and wording of comprehension questions, subjects' familiarity with topic, sentence syntax, concept abstractness, etc. While the previously mentioned factors would affect student performance, the degree to which they cause variation has not been controlled in the construction of an IRI. Criteria variability strongly indicates the need for standardization of informal reading inventories so that the criteria can be set to coincide with each particular passage, thus attempting to control the many different variables affecting student performance.

REFERENCES

Beldin, H. "Informal Reading Testing: Historical Review and Review of the Research." In Reading Difficulties: Diagnosis, Correction and Remediation. Edited by William Durr. Newark, DE: IRA, (1970): 67-84.

Cooper, J. Louis. "The Informal Reading Inventory: Its Construction, Administration, and Use." Unpublished research, Univ. of Conn., Storrs, CN, 1952.

Hays, Warren. "Criteria for the Instructional Level of Reading." Tucson, AZ: Univ. of Ariz., 1975. Document number ED 117 665.

Jongsma, Kathleen S., and Eugene A. Jongsma. "Test review: Commercial Informal Reading Inventories." The Reading Teacher. 34, (March 1981): 607-705.

Pikulski, John J., and Timothy Shanahan, Eds., Approaches To The Informal Evaluation of Reading. Newark, DE: IRA, 1982.

Powell, William R. "Reappraising the Criteria for Interpreting Informal Reading Inventories." In Reading Diagnosis and Evaluation, IRA Conference Proceedings, Vol. 13 Part 4, edited by Dorothy L. DeBoer. Newark, DE: International Reading Association, 1970, 100-109.

Spache, George D. Diagnostic Reading Scales, Monterey, CA: CTB/McGraw-Hill Inc., 1981.

Woods, Mary L. and Moe, Alden J. Analytical Reading Inventory. Columbus, OH: Charles E. Merrill, 1981.