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SEVEN WAYS OF DESCRIBING READING--
McGUFFEY'S AND SIX MORE: PART II

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Abstract

A literature review reveals six traditional ways of describing reading with problems and confusions. Two describe the reading stimuli and four measure reading performance. A solution is to measure the teaching product, learning. Reading learning is measured by ratios and becomes the seventh way of describing reading. The review of the six ordinal methods plus the ratio way to describe reading has both historical and systemic value. The review is divided into four parts: Part I - Lay categories, grade levels, readability formulas, rate, and accuracy; Part II - Reading levels; Part III - Problems and confusions of the six measures and introduction to Precision Teaching, the seventh measure; Part IV - Sixteen Precision Teaching picture

components, discussion, and conclusions. The present article represents Part II of the review.

Reading Levels

Reading levels were suggested early in the 20th century. W. S. Gray (1919), for example, suggested two types of oral-reading exercises be presented children each day: (1) one type was simple, interesting, and to be read "independently"; (2) the second type was carefully graded selections in basic readers designed for learning to recognize words not yet known.

Betts (1946) is credited with formalizing the four levels of reading from both pupil and teacher viewpoints. My step, teaching step, troublesome step, and hearing step are used by Betts for the pupil viewpoint. From the teacher viewpoint the steps are independent, instructional, frustration, and probable capacity, respectively.

Others have added to this description of reading level difficulty (see Table 1). Most use Betts' teacher viewpoint level names. Some suggest other names as substitutes or synonyms. Table 1 shows the author, reference year, and the names used for the four reading levels.

A level of reading is measured by the reader's accuracy and by an expert's opinion of other behavior responses (i.e., expressions of emotionality). Betts' criteria include both accuracy and emotional descriptions.

Table 2 shows 42 reading, comprehension, and interpretation percent accuracy scores suggested by 16 different sources for the four reading levels.

Seven experts suggested reading accuracy scores for the independent or mastery level. Their median reading accuracy was a nearly perfect score, 99%. Their suggestions ranged from 92% to 99.5%. Four experts suggested comprehension accuracy scores. These scores ranged from 75% to 100%, with a median of 92%. Karlin (1967) suggested a 99% accuracy score for interpretation at the independent or mastery level of reading.

Suggestions from ten sources resulted in a 95% median reading accuracy for the instructional level with a range from 79% to 97%. This median permits learning to read new words 5% of the time. Suggested comprehension scores resulted in an 85% median accuracy with a range from 75% to 90%. This median permits improvement in comprehension 15% of the time. Three contributors suggested 73% accuracy for interpreting the words read, permitting improvement 27% of the time. The instructional level permits greater opportunity for learning to interpret and comprehend. Learning to read new words appears less important.

It is difficult to determine where new word learning is recommended. Five reading authorities report 90% reading accuracy as frustration level. Four report 50% comprehension accuracy as frustration level. According to Betts (1946), pupils with less than 90% reading accuracy or 50% comprehension accuracy are apt to evidence signs of undesirable emotionality, that is, wiggling, lip or nail-biting, head movement, finger pointing, and signs of tension and withdrawal.

The capacity for potential reading attainment level is determined by comprehension accuracy after listening to material read. Betts (1946) stated that 75% accuracy establishes the "probable" capacity level. Spache (1963) stated that 60% accuracy will predict a reader's potential.

Spache (1964) further described the instructional and frustration levels, and described the standards of Betts and Smith as arbitrary and too high.

In 1975, Davis found Spache's criteria describing the frustration level of reading acceptable as a general indicator, but unacceptable for determining

TABLE 1

Names Suggested for Four Reading Levels

<u>Author-Year</u>	<u>Independent</u>	<u>Instructional</u>	<u>Frustration</u>	<u>Capacity</u>
W.S. Gray, 1917	Independent	Basic	_____	_____
Thorndike, 1917	Supplementary	_____	_____	_____
Burch, 1928 (Gray & Leary, 1935)	Independent	_____	_____	_____
Killgallon, 1942 (Betts, 1946)	Basal	Instructional	Frustration	Capacity
Betts, (Child) 1946 (Teacher)	My Step	Teaching Step	Troublesome Step	Hearing Step
	Independent	Instructional	Frustration	Capacity
Smith, 1949 (Spache, 1964)	_____	Instructional	_____	_____
Harris, 1956	Independent	Instructional	Frustration	_____
Hellman, 1961	Independent	_____	_____	_____
Smith & Harris, 1963	_____	Instructional	_____	_____
Spache, 1963, 1964	Independent	Instructional	_____	Potential
	Silent Reading	Oral Reading	_____	Listening
Strang, 1964	Independent	Instructional	Frustration	Capacity
McCracken, 1966	Independent	Instructional	Frustration	_____
Dolch, 1967	Recreational	Individualized	_____	_____
Karlin, 1967	Basic	Instructional	_____	_____
Davis, 1975	_____	_____	Frustration	_____

TABLE 2

Percent Accuracy Suggested for Four Reading Levels

Author	Year	Independent			Instructional			Frustration			Capacity		
		Read.	Comp.	Int*	Read.	Comp.	Int	Read.	Comp.	Int	Read.	Comp.	Int
Gray	1917	92	--	--	--	--	--	--	--	--	--	--	--
Thorndike	1917	99.5	--	--	--	--	--	--	--	--	--	--	--
Burch	1928	--	75	--	--	--	--	--	--	--	--	--	--
Killgallon	1942	--	--	--	95	--	--	--	--	--	--	--	--
Betts	1946	99	90	--	95	75	--	90	49	--	--	75	--
Smith	1949	--	--	--	88	85	73	--	--	--	--	--	--
Harris	1956	97	--	--	95	--	--	90	--	--	--	--	--
Heilman	1961	94	--	--	--	--	--	--	--	--	--	--	--
Smith & Harris	1963	--	--	--	95	90	73	--	--	--	--	--	--
Spache (G 1&2)	1963	--	--	--	79	85	--	--	--	--	--	60	--
Spache (G 3-8)	1963	--	--	--	92	85	--	--	--	--	--	--	--
Strang	1964	--	--	--	--	--	--	90	50	--	--	--	--
McCracken	1966	99	95	--	97	79	--	88	50	--	--	--	--
Dolch	1967	--	--	--	96	--	--	--	--	--	--	--	--
Karlin	1967	99	100	99	93	85	70	--	--	--	--	--	--
Davis	1975	--	--	--	--	--	--	90	50	--	--	--	--
Number	16	7	4	1	10	7	3	5	4	0	0	2	0
Range		7.5	25	--	18	15	3	2	1	--	--	15	--
Median		99	92	99	95	85	73	90	50	--	--	68	--

*Reading. Comprehension. Interpretation.

individual pupil levels. To test these criteria, Davis used three measurements on a polygraph, the criteria of polygraph and neurological experts to test 62 children in grades 3, 4, and 5 from three major ethnic groups. Davis found that accuracy in comprehension ranged from zero to 99% during frustration, while oral reading errors ranged from zero to as high as 38%. Frustration, it would seem, is independent of reading and comprehension accuracy.

Watching swimmers and other athletes perform would confirm this position. No matter how poorly coordinated and error-laden a beginning competitive swimmer seems to be, great elation can be observed each time a personal record is established. For beginners, this occurs nearly every time they compete. Swimming errors are opportunities for corrective practicing. Frustration enters later, as the consequences increase and high expectations are not met.

McCracken (1963) tied oral reading frequencies to the levels of reading. McCracken (1963) also reported both correct and error minimal oral reading rates for the independent, my step, or mastery level of reading. His data show pre-primer mastery to be 60 words per minute, with allowance for a little more than one error per minute. The frequencies increase in a straight line on multiply-divide chart paper to the fourth grade, where they flatten out to grade seven at 150 correct words per minute with two errors.

For the instructional level, the teaching step, McCracken (1963) suggested oral reading frequencies between 48 and 60 words per minute for pre-primer material. He also suggested 120-150 words per minute from fourth through seventh grade. Error frequencies ranged from 4-7.

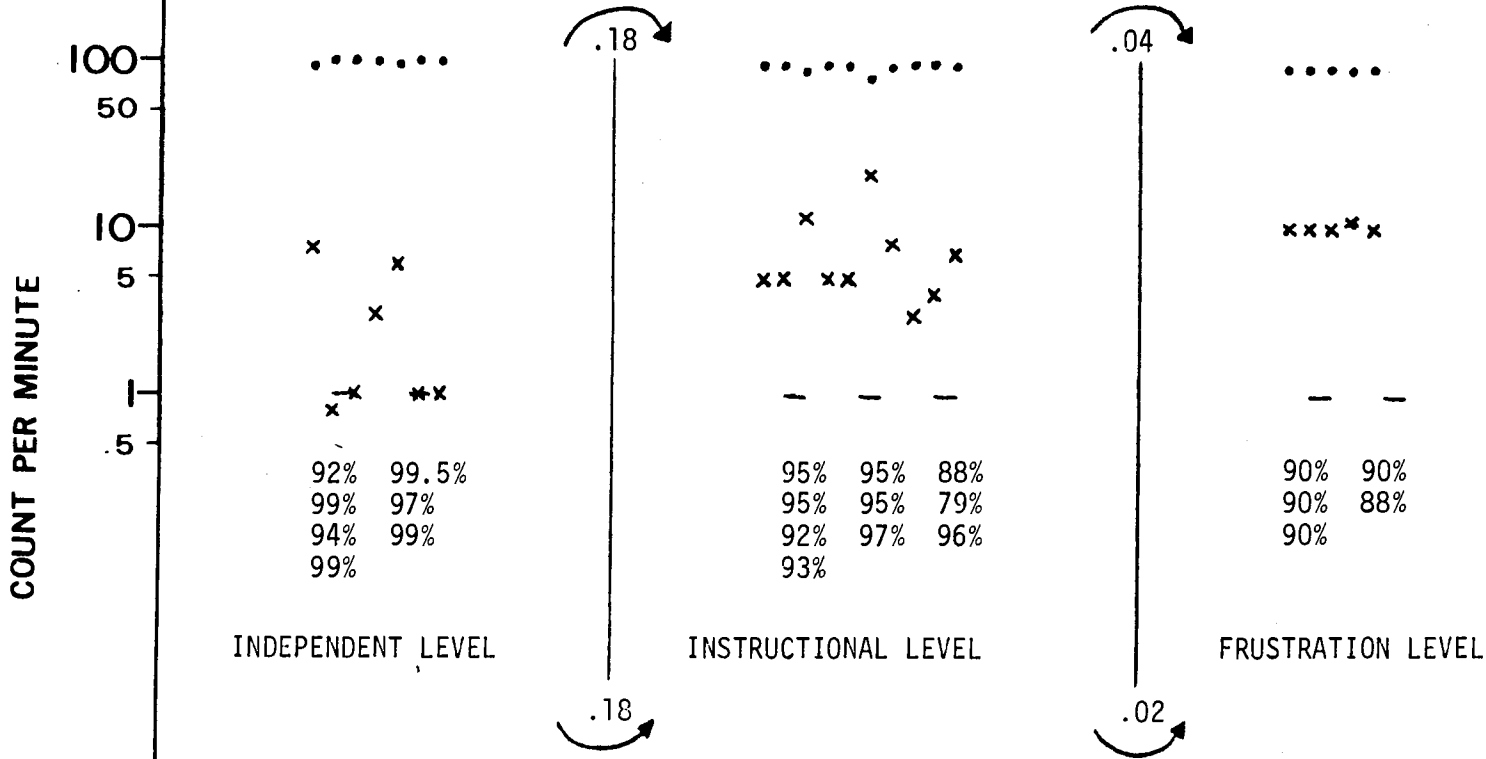
Starlin's work (1970) appears to agree with McCracken's instructional ranges, showing oral reading frequencies as low as 100 correct words per minute in senior high school. However, Starlin's reported error frequencies were lower (one per minute).

Similar results were reported for correct oral reading frequencies by Kunzelmann (Washington State Superintendent of Public Instruction, 1974) and by Beck (1974), although neither reported the error frequencies.

Oral reading accuracy is more completely described when charted as frequencies correct and incorrect than merely stated as percent. To illustrate this, the reading accuracy percentages reported in Table 2 were charted in Chart 1 as words read correctly and incorrectly per minute, assuming 100 total words had been read in one minute. Chart 1 shows the ratio distances between corrects and errors. Most of these ratios across all three reading levels exceed x9. Very little learning can occur with greater than x9 beginning accuracies (Neely, 1978; Neely and Lindsley, 1978b; Sokolove, 1977-78). It is also evident from Chart 1 that "real" frequencies would show actual pupil performance, rather than logical achievement. For example, 94% correct logically results in 6 errors for every 100 words read. However, if only 50 total words had been read, the actual error frequency would have been less than logic, that is, 3, resulting in even fewer opportunities to learn.

The assumed data in Chart 1 were subjected to statistical analysis. No significant difference was found in reading words correctly between the independent and instructional levels (using the median test with Fisher's

Chart 1. Reading Percent Accuracy Scores Suggested by Ten Authorities for Four Reading Levels: Percent Correct Charted as Assumed Frequencies



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10 Authorities in the field of Reading suggest reading % accuracy scores for 4 reading levels

(charted as words read correctly and incorrectly per minute, assuming 100 total words had been read in one minute)

exact $p = .18$). A significant statistical difference was found between the instructional and frustration mastery levels ($p = .04$).

In analyzing errors, no significant difference was found between the independent and instructional levels ($p = .18$). A significant statistical difference was found between the instructional and frustration levels ($p = .02$). However, Chart 1 indicates that 4 of 10 authorities suggested error frequencies at the instructional level approaching or greater than the most common frequency suggested for the frustration level.

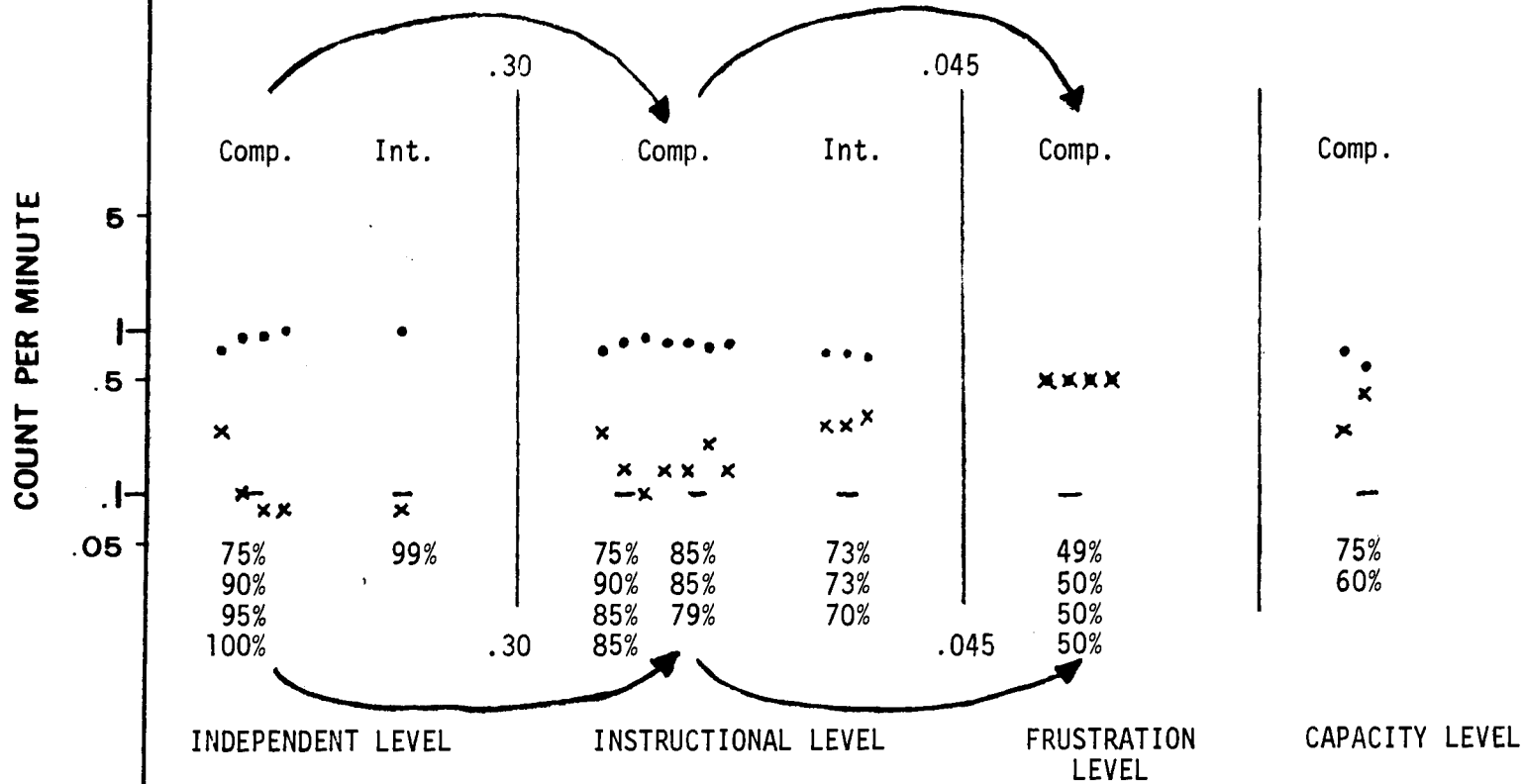
The comprehension and interpretation percent accuracy scores reported in Table 2 were charted in Chart 2 as correct and incorrect responses per minute, assuming 10 total responses in a 10-minute exercise. No significant difference was found between the independent and instructional correct or error comprehension responses (the median test with the Fisher's exact $p = .30$ for both). The correct to error ratios ranged from x3 to x9 for both reading levels. Comprehension at the capacity level was also x3.

A significant difference was found between the instructional and frustration correct and error comprehension responses ($p = .045$). Interpretation data were similar to the comprehension data.

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Chart 2. Comprehension and Interpretation Percent Accuracy Scores Suggested by Ten Authorities for Four Reading Levels: Percent Correct Charted as Assumed Frequencies



Neely, Malcolm. Seven ways of describing reading-- McGuffey's and six more: part II. *Journal of Precision Teaching*, Volume II, Number 4, Winter, 1982.

Comp. = Comprehension
 Int. = Interpretation

10 Authorities in the field of Reading

suggest comprehension and interpretation % accuracy scores for 4 reading levels

(charted as correct and incorrect responses per minute, assuming 10 total responses in a 10-minute exercise)

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