DOCUMENT RESUME

ED 110 935 CS 002 087

AUTHOR Allington, Richard L.; And Others
TITLE Poor and Normal Readers Achievement on Visual Tasks Involving High Frequency Low Discriminability Words.
PUB DATE May 75
NOTE 14p.; Paper presented at the Annual Meeting of the International Reading Association (20th, New York City, May 13-16, 1975)

EDRS PRICE MF-$0.76 HC-$1.58 Plus Postage
DESCRIPTORS Elementary Education; Grade 3; *Reading Difficulty; *Reading Processes; *Reading Research; *Visual Discrimination; Visually Handicapped; Visual Perception; *Visual Stimuli; Word Recognition

ABSTRACT

This study presented 24 third graders drawn from suburban elementary schools with high frequency, low discriminability words in four conditions. Subjects were randomly assigned to the four tasks individually. It was hypothesized that poor and normal readers would differ in their ability to read high frequency, low discriminability words presented tachistoscopically in isolation but would not differ in their ability to match the words to form, to graphically reproduce the words following a tachistoscopic presentation, or to select the appropriate word from a group of distractor words after a tachistoscopic presentation. The hypotheses were supported. It was concluded that a visual perceptual deficit is probably not a major factor in reading disability. (TS)

Poor and Normal Readers Achievement on Visual Tasks Involving High Frequency Low Discriminability Words

Richard L. Allington
Reading Department
State University of New York at Albany
1400 Washington Avenue
Albany, New York 12222
(518) 457-8242

Kathleen Gormley
Reading Department
State University of New York at Albany

Sharon Truex
Reading Department
State University of New York at Albany

Paper presented at the 20th Annual Convention of the International Reading Association, New York, May 15, 1975.

Poor and Normal Readers Achievement on Visual Tasks Involving High Frequency Low Discriminability Words

Richard L. Allington
Kathléen Gormley
Sharon Truex

Abstract

Previous studies have demonstrated that the performance of poor and normal readers does not differ significantly on various perceptual tasks involving visual stimuli. However, the stimuli employed has generally been novel or low frequency words. Thus, visual attention to stimulus may have increased as a function of novelty. This study presented subjects with high frequency, low discriminability words in four conditions. It was hypothesized that poor and normal readers would differ in the ability to read these words presented tachistoscopically in isolation, but would not differ in their abilities to match the words to form, graphically reproduce the words following a tachistoscopic presentation, or select the appropriate word from a group of distractor words after a tachistoscopic presentation. The hypotheses were supported. It was concluded that a visual perceptual deficit is unlikely a major factor in reading disability.

In the field of reading/learning disabilities the perceptual deficit hypothesis is widely accepted. One has only to survey the literature, or the instructional materials in use, to ascertain the influence that has been generated by the advocates of this proposition. From the original works of Orton (1925, 1937) who proposed that reading disability could be attributed to a lack of established hemispheric dominance, to the more recent advocates (Bender, 1957; Frostig, 1967; Anapolle, 1967; Cruickshank, 1972) visual perceptual problems have been trumpeted as a primary source of difficulties in learning to read. Inherent in the perceptual deficit hypothesis is the assumption that reading disability is a resulting effect of inaccurate perception of letters and words.

Recently, however, an accumulation of research has indicated tha reading disability cannot be attributed to a visual perceptual deficiency. Some interesting research results indicate that disabled readers accurately perceive letters, symbols, and words, but incorrectly label them because of difficulty in making the verbal associations. In two separate experiments, (Vellutino, Steger and Kandel, 1972; Vellutino, Smith, Steger and Kaman, 1974) employing subjects selected from second to eighth grades, poor readers achieved a considerably better performance in visual recall of words presented tachistoscopically, than they did in pronouncing those same words. Similar results were achieved when these subjects were required to graphically reproduce the stimuli. Of further interest in these studies is that the poor readers generally reproduced the stimuli correctly even though they had a large number of apparent spatial and sequential errors in an oral reading of the stimuli (e.g. was/sa bin/din, cob/cod, lion/loin, snug/sung).

In another study (Vellutino, Steger, DeSetto, and Phillips, in press), poor and normal readers were compared on their retention of visually presented Hebrew letters. Retention was measured immediately following presentation, twenty-four hours and six months after presentation. Poor readers performed as well as normal readers in both the short term and the long term retention suggesting that deficient visual memory cannot be considered a significant factor in reading disability.

In each of the Vellutino, et.al. studies, subjects were carefully selected in that they had to achieve either a verbal or performance I.Q. of 90+ as measured by the Wechsler Intelligence Scale for Children. Subjects were also screened for gross physical defects, uncorrected auditory or visual acuity problems, severe emotional disorder, and frequent absence from school. Poor readers were selected from a pool of children referred to a learning disability center and who had received one or more years of reading remediation. Normal readers were selected on the basis of reading tests performance and teacher judgement. The authors state this procedure was used to maximize the probablity of using subjects sustaining a primary reading disability.

To further examine the hypothesis that a perceptual deficit is not the major difficulty for poor readers, the study reported here presented poor and normal third grade readers with high frequency low discriminability words in four varying perceptual tasks. As pointed out earlier, Vellutino et. al. explored this hypothesis using novel stimuli and low frequency words. Clinical and classroom experience with children indicates many high frequency words present difficulty for beginning readers and poor readers. Therefore,

this hypothesis was explored using more generalizable stimuli frequently encountered by all readers in the reading act.

METHOD

Subjects: The twenty four subjects selected for this study were drawn from the third grade population of a tri-cities (Albany, Schenectady, Troy) suburban elementary school. Subjects ranged in age from 8.0 to 9.7 and included 10 females and 14 males. The subjects were judged as poor readers if they scored at or below the third stanine on the Metropolitan Achievement Test (MAT), Primary II form F. The normal readers were selected from subjects scoring at the sixth stanine on the same form of the MAT. The MAT was administe to all students at this grade level. The 24 subjects for this study were randomly selected from the pool of all students scoring at the above mentioned stanine levels.

Stimuli: The stimuli employed were high frequency low discriminabili words. All words appeared on the Durr list of 188 most frequent words (Durr, 1974), at or below the core first reader word list of the Harris-Jacobson basic elementary reading vocabularies (1972), and on the Dolch 220 list (1936). Figure 1 lists the words used in this study.

Procedure: Subjects were presented each of four tasks individually. Both subject selection order and task presentation order were randoml assigned. The four tasks were:

Match to form (MF) - presented a target stimulus positioned to the extreme left and separated from the 3 distractors by a single verticle line. Subjects were directed to select the distractor item that "looked exactly like the word in the first row." For this,

task stimuli were printed in black primary type on white paper and presented a single row at a time.

Delayed Recall (DR) - presented stimuli tachistoscopically by an EDL Tach-X with presentation time of 1 second duration. Immediately after the flash presentation subjects were directed to select and mark the word presented from a line including 3 distractor items. These stimuli for selection were also printed in black primary type on white paper.

Reproduce from memory (RM) - presented stimuli tachistoscopically by an EDL Tach-X with a presentation time of 1 second duration. Immediately following the flash presentation of each word, subjects were instructed to write the word or as much of it as they could remember. Each subject was provided individual 4" x 4" sheets of plain white paper on which they were to reproduce the stimuli.

Reading words in isolation (WI) - stimuli were again tachistoscopically presented by an EDL Tach-X with a presentation time of 1 second duration. Subjects were directed to read each word as presented.

For words presented tachistoscopically three separate filmstrips were prepared with the stimuli randomly ordered. The filmstrip provided a black stimulus on a clear background when presented on a white screen.

RESULTS

It was predicted poor and normal readers would differ significantly in their ability to read tachistoscopically presented words in isolation but that their achievement would not differ significantly on the remaining tasks. Therefore, the means of the two groups were compared on each task; these are represented in Figure 2.

Insert Figures 1 and 2 About Here

On the MF task the hypothesis was confirmed. Poor readers ($\bar{X}$ = 19.92; S.D. = .288) and normal readers ($\bar{X}$ = 20.0; S.D. = 0.0) achievement did not differ significantly ($t = -.99$; $df = 22$; $p < .01$) in the ability to visually match stimuli. This suggests that these poor readers have developed the ability to identify and match the necessary distinctive features, whatever they may be, for successful completion of this task.

The analysis on the DR task again confirmed that there was no significant difference ($t = -1.191$; $df = 22$; $p < .01$) between the achievement of poor readers ($\bar{X}$ = 18.66; SD = 1.78) and normal readers ($\bar{X}$ = 19.33; S.D. = .79). Thus reconfirming the conclusions of Vellutino, et.al.(in press) that reading disability cannot be attributed to a deficiency in visual memory.

The results on the RM task again indicated no significant difference ($t = -2.13$; $df = 22$; $p < .01$) in the performance of poor readers ($\bar{X}$ = 16.83; S.D. = 3.86) and normal readers ($\bar{X}$ = 19.25, S.D. = .75). Thus further support is given to the contention that a perceptual deficit, per se, cannot adequately explain reading disability.

However, on the WI task the achievement of poor readers ($\bar{X}$ = 14.42, SD = 2.47) and normal readers ($\bar{X}$ = 17.75, SD = 1.06) differed significantly (t = -4.31; df = 22; $p < .01$). This result is not surprising if one considers the fact that subjects were selected on their reading ability. While the MAT does not present words tachistoscopically nor in isolation, both tests require word identification abilities.

Further inspection of individual responses provided additional data. For all subjects on three tasks; match to form, delayed recall, and reproduce from memory, a total of 1440 responses occurred. The error rate was phonemonally low, less than five percent. Five words; where, than, then, went, want, accounted for sixty percent of all errors made on these three tasks. Reversals, a frequent concern in the literature on reading disability, accounted for less than one-half percent of all responses, even when using the sum of whole and partial reversals. These data seem then to demonstrate the subject's mastery of these basic visual perceptual tasks.

On the word identification task five words; than, what, were, want, of, accounted for over sixty percent of the errors of the poor readers. Three of those same words; than, were, of, accounted for nearly three-quarters of the errors made by the normal readers. The most frequent confusions made by all subjects on this task were where for were (12 of 14 incorrect responses), went for want, (9 of 13 incorrect responses) and then for than (14 of 17 incorrect responses). Thus, while words were selected for their frequency and low discriminability, certain pairs of the stimuli which differed only in a single feature seemed to present the greatest difficulty in flash recognition

DISCUSSION

The hypotheses that poor readers sustain no visual perceptual deficits were generated from the theoretical view, proposed by Vellutino, et. al. These data reinforce that viewpoint as recently summarized (Vellutino, Steger, Moyer, Harding, and Niles, 1974). Thus, the present study was an attempt to determine if the perceptual deficit hypothesis would be confirmed when using a set of stimuli which frequently occur in all reading material. The stimuli employed in previous research efforts were often unfamiliar or novel to the subjects; therefore the absence of perceptual confusions might have been attributable to the uniqueness of the task.

The question that remained to be answered was: Do children exhibit perceptual confusions in words often cited as high-frequency, low discriminability and of low meaningfulness. The present study strongly suggests that poor readers and normal readers exhibit no differences in performance on the three perceptual tasks. When poor readers were required to verbally identify these same visual stimuli they often responded with a graphically similar word. Previously, such errors have been interpreted as evidence of a dysfunction in perceptual encoding abilities/strategies of poor readers (Orton, 1925, 1937; Bender, 1957; Frostig, 1967; Anapolle, 1967; Cruickshank, 1972).

The practical application of these results leads one to seriously question the validity of many commonly practiced remedial techniques in visual perception. It may be, as Vellutino, et. al. have proposed, that the difficulty encountered by poor readers is one of the verbal mediation/association rather than that of the frequently cited perceptual deficit hypothesis. Perhaps, at the

earliest stages of reading acquisition students who lack the necessary perceptual skills, or at least are somewhat unskilled in applying them begin responding to these high frequency low discriminability words somewhat haphazardly. In time the necessary perceptual skills develop but the inaccurate response patterns continue, having become habituated through practice. The students in this study seemed to have all the necessary prerequisites for accurate identification of the selected words and yet the difference in achievement on the word identification task leaves little doubt of the superiority of the normal readers. Before assuming the poor readers have an innate deficit of some sort it is advised that further research be conducted to establish whether effective teaching can eradicate the erroneous response patterns.

Finally, the poor record of visual-motor training programs (Hammill, Goodman, Wiederholt, 1974) may be attributed not so much to ineffective training programs as to inappropriate training programs; the students do not need training in these skills. The students in our experiment were beyond the readiness stage, where much of the research in visual perceptual processes has been conducted. However, visual perceptual training is not uncommon in programs for the disabled reader, regardless of age. These results should serve to cast serious doubts on the validity of the use of these training procedures without a thorough examination of the prerequisite abilities of the student.

BIBLIOGRAPHY

Anapolle, L. Visual Training and Reading Performance. Journal of Reading, 1967, 10, 372-382.

Bender, L. Specific Reading Disability as a Maturational Lag. Bulletin of the Orton Society, 1957, 7, 9-18.

Cruickshank, W. M. Some Issues Facing the Field of Learning Disability. Journal of Learning Disabilities, 1972, 5, 7, 380-383.

Dolch, Edward. A Basic Sight Vocabulary. The Elementary School Journal, 1936, 36, 6, 456-460.

Durr, William. A Computer Study of High Frequency Words in Popular Trade Juveniles. Reading Teacher, 1973, 27, 37-42.

Frostig, M. Education of Children with Learning Disabilities. In E. C. Frierson and W. B. Barbe (Eds.), Educating Children with Learning Disabilities. New York: Appleton-Century-Crofts, 1967.

Hammill, D., Goodman, L., Wiederholt, J. L. Visual Motor Processes: Can We Train Them? The Reading Teacher, 1974, 27, 4, 469-478.

Harris, A.J., Jacobson, M. D. Basic Elementary Reading Vocabularies, New York: Macmillan Company, 1972, 60-62.

Orton, S.T. "Word-blindness" in School Children. Archives of Neurology and Psychiatry, 1925, 14, 581-615.

Orton, S.T. Reading, Writing and Speech Problems in Children. London: Chapman and Hall, 1937.

Vellutino, F.R., Smith, H., Steger, J.A. and Kaman, M. Reading Disability: Age Differences and the Perceptual Deficit Hypothesis. Research Report 815, 1974.

Vellutino, F.R., Steger, J. A., DeSetto, L. and Phillips, F. Immediate and Delayed Recognition of Visual Stimuli in Poor and Normal Readers. Journal of Experimental Child Psychology, in press.

Vellutino, F. R., Steger, J. A. and Kandel, G. Reading Disability: An Investigation of the Perceptual Deficit Hypothesis. Cortex, 1972, 8, 106-118.

Vellutino, F. R., Steger, B. M., Boyer, S. C., Harding C. J. and Niles, J. A. Has the Perceptual Deficit Hypothesis Led Us Astray? An Examination of Current Conceptualizations in the Assessment and Treatment of Exceptional Children. Paper presented at Annual International Convention of the Council for Exceptional Children, New York City, April, 1974.

Fig. 1: The high frequency, low discriminability words employed in this study.

went	but
than	then
when	that
what	of
where	saw
they	there
were	on
here	for
was	with
want	this

FIG. 2. MEANS OF GROUPS ON EACH TASK.