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ABSTRACT

In a partial replication of Samuels' (1972) experiments, 60 first grade pupils were assigned to a letter name group, a letter discrimination group, or a control group to investigate the effect of letter name knowledge on learning to read words. Artificial letters formulated by Gibson, et al. (1962) were used instead of those of Samuels, and different results were obtained. A two-way analysis of variance, followed by Tukey comparisons, revealed that the letter name group completed the transfer task (Learning words) in significantly fewer trials than either the control or letter discrimination groups, which did not differ. Sex differences and interactions were not significant. (Author)

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LETTER-NAME KNOWLEDGE AS A PREREQUISITE TO LEARNING TO READ

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LETTER-NAME KNOWLEDGE AS A PREREQUISITE TO LEARNING TO READ[1]

The results and conclusions of two recent experimental studies (Samuels, 1972; Jenkins, Bausell, & Jenkins, 1972) have raised serious questions concerning the importance of teaching letter names to beginning readers. Letter names have usually been taught to children because of the presumed transfer effects such knowledge would have when the children learned words composed of those letters. However, Samuels (1972) and, to a lesser degree, Jenkins et al. (1972) did not find those transfer effects. Because of the importance of this question to educators, further examination of the issue and further experimentation are necessary.

Researchers have long reported letter-name knowledge as being an efficient predictor of first-grade reading success (Dykstra, 1970; Wylie, 1967; Silvaroli, 1965; Olson, 1958; Gavel, 1958; Wilson & Flemming, 1940). Olson (1958) found that only nine of 1,172 children could learn 70 or more words without letter-name knowledge of at least 20 letters. He concluded that although letter-name knowledge does not guarantee high reading achievement, "the lack of that knowledge assures low reading achievement [p. 35]."

The results of classroom studies in which children were specifically taught letter names are mixed. Durrell and Murphy (1963) reported several studies where letter-name instruction definitely aided subsequent reading performance, while Ohnmacht (1969) and Johnson (1970) did not find such instruction to be helpful. Ohnmacht, however, did find that first-grade children with below average reading readiness performed better on the measure of word knowledge when given training on letter names.

Tulnman, Kasow, and Holt (1970) reported that letter-name knowledge seemed to facilitate learning selected sight words but were reluctant to generalize beyond their experimental criteria.

Samuels (1972) and Silvaroli (1965) stated that the high correlation usually found between letter-name knowledge and subsequent reading achievement should not be construed to imply causation. The interrelationship between such factors as socio-economic background, I.Q., and letter-name knowledge is a complex one, and Samuels viewed the correlational findings as possibly being "a product of uncontrolled organismic or environmental conditions [1972, p. 72]."

The experiments most relevant to the present study are those of Samuels (1972) and Jenkins et al. (1972). Jenkins et al. (1972) found letter names easier for first-graders to learn than letter sounds. In several experiments using Williams' (1969) artificial orthography, their findings concerning transfer (learning the words in, it, at, an) were not completely clear-cut. In their first experiment, letter-name and letter-sound groups did not differ significantly on transfer, but both groups performed significantly better than the control group; in their third experiment, the letter-sound group performed significantly better on transfer than both the letter-name and control groups, which did not differ.

Samuels (1972) conducted two experiments with first-grade children to investigate the influence of letter-name training and letter-discrimination training on learning to read words. Letters and words were composed of specially constructed graphemes (Jeffrey & Samuels, 1967). Samuels found that letter-name

training did not help the children to read the words; neither the letter-name nor letter-discrimination group differed significantly from the control group on the transfer task. However, there is a possibility that his graphemes, devised to be totally different from English orthography, were too unusual and possibly baffling to the young children. The purpose of the present study, therefore, was to investigate the effect of letter-name training on a transfer task of reading words, with the use of simpler graphemes formulated by Gibson, Gibson, Pick, and Osser (1962).

The question to be answered in this study was as follows: Will a partial replication of Samuels' (1972) study, using simpler graphemes, yield similar results concerning the effect of letter-name knowledge on learning to read words?

Method

Subjects

Subjects were 60 first-grade pupils (M = 30, F = 30) from two public schools in New London, Connecticut, tested during October and November, 1973. All the first-grade pupils from one school were used, and pupils from the second school were randomly selected to equalize the experimental and control groups.

Procedure

The procedure, modeled after Samuels' (1972) paired-associate tasks with corrective feedback, provided for individual testing of subjects, who were randomly assigned to three groups, the Letter-Discrimination Group, the Letter-Name Group, and the Control Group. After being given appropriate sample tasks (different for each group), the three groups were given different training tasks; all groups then performed the same transfer task.

On both the training and transfer tasks, each student was shown a series of four randomly presented 5" x 8" index cards, one at a time, until he achieved one perfect trial. If the student did not achieve one perfect trial by 40 trials on the training task, he was eliminated and a replacement was obtained. Each student was then tested until he achieved one perfect trial on the transfer task or until he reached the fortieth trial.

For the training task, the Letter-Discrimination Group was shown four cards, each containing one of the four graphemes and four geometric figures (square, circle, cross, triangle). The student had to associate each grapheme with the appropriate geometric figure, which varied in position from card to card. The student pointed to his choice on each card. The Letter-Name Group was shown four cards, each containing one of the four graphemes. The student had to learn to say the letter name associated with each grapheme. (S, M, E, and A were the letters used.) The Control Group was shown four cards, each containing a different picture of a dog. The student had to learn to say the name of each dog.

The transfer task for all three groups used the four graphemes in combinations to form four, two-letter words (SE, SA, ME, and MA, pronounced "see," "say," "me," and "may"), which were again printed on index cards. The student had to learn to say the word assigned to each of the four pairs. Figure 1 shows the graphemes used for training and transfer, along with Samuels' graphemes.

Insert Figure 1 about here

Statistical Treatment

Two-way analyses of variance, treatments x sex, were computed for experimental and control groups for training trials to criterion and for transfer trials to criterion. The Tukey (hsd) test was used to compare pair means. Pearson product-moment correlations were computed for transfer trials paired with training trials within each group.

Findings

Table 1 presents means and standard deviations for trials to criterion during training and transfer for all three groups.

Insert Table 1 about here

Analyses of variance results for training and transfer trials revealed significant differences among the three groups. For training, treatment effects were significant at the .001 level ($F = 11.25$, $df = 2/54$). Tukey comparisons revealed that the Letter-Name Group and the Letter-Discrimination Group completed the task in significantly fewer trials than the Control Group ($p < .001$). There was no significant difference between the Letter-Name and Letter-Discrimination Groups.

For transfer, treatment effects were significant at the .005 level ($F = 6.08$, $df = 2/54$). Tukey comparisons revealed that the Letter-Name Group completed the task in significantly fewer

trials than either the Control Group ($p < .05$) or the Letter-Discrimination Group ($p < .01$). There was no significant difference between the Letter-Discrimination and Control Groups.

There were no significant differences between the sexes on the measures of training or transfer, and interactions were not significant for either training or transfer. Correlations between training trials and transfer trials were not significant within any group.

An attempt was made in another school to replicate the study with kindergarten children being given the actual alphabet letters instead of Gibson's artificial orthography. Two classes of kindergarten children were tested in November, 1973. Of the 37 children, 24 could not be used because they could name one or more of the lower case alphabet letters s, m, e, and a; one child could not be used because of an English language problem; seven children could not complete the training task in 40 trials; four children could not complete the transfer task in 40 trials; and one child refused to continue the transfer task after four trials. Therefore, the task was not suitable for any of the 37 children.

Discussion

This study has shown that the issue of letter-name knowledge as a prerequisite to learning to read words is by no means a closed one. Samuels' (1972) study showed that letter-name knowledge of the artificial graphemes he used did not help the children to read words composed of those graphemes. However, by changing a variable so that a set of simpler graphemes (Gibson et al., 1962) was used, different results were obtained. There-

fore, Samuels' results should not be regarded as definitive. Additionally, Samuels' transfer data (reading words) from his second experiment, although not resulting in statistically significant differences, did reveal that his Letter-Name Group had a mean of 16.84 trials to criterion and his Letter-Discrimination and Control Groups had means of 19.88 and 22.24.

Another pertinent issue concerns the use of artificial orthography as a valid measure. Rystrom (1973) stated "the use of artificial letters is always problematic because of possible interference between traditional and research orthography. There is no way to be certain children are not equating artificial letters with a different letter representing some other letter-sound relationship, such as the circle and the letter o. Hence, the results of both studies [Samuels, 1972; Jenkins et al., 1972] appear to be valid in the research setting, but they do not necessarily apply to the normal school setting [pp. 174-175]." An experimental study using real letters with kindergarten children who have not yet learned to name those letters would be desirable; however, the difficulties encountered in finding children at the appropriate stage of readiness to learn letter names may not be easily overcome.

Tuinman et al. (1970) have raised additional pertinent issues concerning problems of data analysis; they noted that data in certain types of verbal learning experiments may not meet the assumptions of analysis of variance and also that the reliability of measurement criteria may not be satisfactorily assessed because of the nature of the experimental tasks. For example, they

questioned criteria for saying that a child had learned a word; the measurement of a child's performance per trial block in which all words must be produced without error might very well be different from the results obtained by counting a word correct even if other words in the block are missed.

Whether or not letter-sound training is superior to letter-name training in facilitating reading achievement is another question. Samuels (1972) felt that a task analysis suggested the superiority of letter-sound training, and Jenkins et al. (1972) came to a similar conclusion. Not surprisingly, letter-sound training in combination with letter-name training has been found to be superior to letter-name training alone on measures of word knowledge, word discrimination, and comprehension (Ohnmacht, 1969). Jenkins et al. (1972) found that "given middle class educational conditions where children enter school with some knowledge of letter names, acquisition of a reading vocabulary progresses more rapidly after phoneme training [p. 85]." Durrell (1958) recommended early and systematic teaching of letter names and sounds.

The results of the present study are in agreement with the view that letter-name knowledge aids the child who is learning to read (Chall, 1967; Durrell & Murphy, 1963; Olson, 1958) and would support the statement by Calfee, Chapman, and Venezky (1972) that "to read English a child must learn to isolate, differentiate, and identify the letters of the alphabet [p. 145]."

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Footnote

[1]This study is a summary of an M.S. thesis completed by the first author under the direction of the second author. The authors thank Alice Neilan for providing access to the New London schools and principals Edwin McDonough, Jack Sullivan, and Robert Dolph for their cooperation. Suzanne George assisted with the statistical analyses.

Table 1 Means and standard deviations for trials to criterion during training and transfer

Group	Sex	N	Variable: training Mean (max.= 40)	training S.D.	transfer Mean (max.= 40)	transfer S.D.
Letter-	M	10	1.60	.80	23.80	13.20
Discrimination	F	10	1.80	1.47	29.40	12.04
Group	M&F	20	1.70	1.18	26.60	12.93
Letter-	M	10	2.20	1.66	15.20	14.01
Name	F	10	1.80	.60	9.40	10.71
Group	M&F	20	2.00	1.26	12.30	13.74
Control	M	10	6.00	3.74	25.00	15.01
Group	F	10	9.50	9.52	23.90	14.17
	M&F	20	7.75	7.48	24.45	14.61

Figure Caption

Fig. 1. Samuels' graphemes, Gibson's graphemes (training letters), and transfer words.

GRAPHEMES			Transfer Words	
Samuels'	Gibson's	pronounced		pronounced
𐤌	𐤌	M	𐤌𐤀	MĒ
𐤎	𐤎	S	𐤎𐤀	SĒ
𐤀	𐤀	A	𐤎𐤀	SĀ
𐤄	𐤄	E	𐤌𐤀	MĀ