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ABSTRACT

The extent to which intralist similarity affects kindergarten pupils' rate of acquisition, word recognition skills, and tendency to generalize responses to similar words was investigated. The subjects were 54 children from a semirural elementary school who had had no formal training in letter recognition. Three acquisition lists were used to represent increasing intralist similarity. Word recognition and generalization tasks were constructed. The children, randomly assigned to learn each list, were given prefamiliarization training and then were given acquisition and test trials. Analysis of variance results revealed no significant differences between groups in the serial-order trial condition, but showed that introduction of intralist similarity impeded rate of acquisition. The medium-similarity group responded more like the no-similarity group than like the high-similarity group. It was concluded that, contrary to the findings of previous studies, the present results implied that medium similarity is sufficiently effective for use with beginning readers since it allows rapid initial learning while causing greater accuracy in subsequent word recognition than no similarity. Tables of results and references are included. (MS)

EFFECT OF INTRALIST SIMILARITY ON KINDERGARTEN PUPILS' RATE OF WORD ACQUISITION AND TRANSFER

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ABSTRACT

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Studies of kindergarten pupils have shown that while low intralist similarity results in more rapid acquisition than high intralist similarity there are also more incorrect identifications and false generalizations on transfer tasks. The inference has been that if pupils were taught highly similar words they would make fewer subsequent errors because they would be less prone to fixate on single features of the words. The focus has, however, been on the extremes: high versus low similarity. Data from the present study, designed to extend the earlier results through procedural changes, suggest that moderate similarity may also result in efficient learning. The main implication has to do with the pragmatic matter of preparing beginning reading materials.

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Anderson and Dearborn (1952, p. 215) have suggested that children tend to see one detail in a word, such as one or two letters that stand out. More recently, Marchbanks and Levin (1965) reported that beginning readers recognize words on the basis of letter cues rather than by word shape. If letter cues are, in fact, the basis of word recognition for beginning readers, then words that are dissimilar in letter content should be more easily learned than similar words having the same letter content but in different combinations of letters.

Following this line of reasoning, Samuels and Jeffrey (1966) pointed out that the basis for the selection of the words introduced in beginning reading materials is frequency of usage. High frequency words, it turns out, are often dissimilar in appearance, being composed of different letters (e.g., the, for). Thus, a beginning reader

encountering these dissimilar words is easily able to discriminate between them on the basis of one or two letter cues.

While it is important to facilitate the learning of words for beginning readers by teaching words that are highly dissimilar and readily differentiated, the word attack skills that are developed from this initial experience with words are an equally important consideration. Bishop (1964) states that "one of the most important criteria for the effectiveness of teaching methods is the amount of transfer which a method yields." Thus, the words initially presented to the beginning reader should be selected not only on the basis of ease of learning but also on the basis of the amount of transfer that will result from that learning, because one of the major goals in the teaching of reading is the development and fostering of accurate, efficient, and independent word attack skills.

Two recent studies have dealt with the effect of intralist similarity of words on beginning readers' rate of acquisition and their ability to transfer the word attack skills learned from the initial experience to new but similar words. Samuels and Jeffrey (1966) studied the effect of teaching kindergarten pupils real word associations to words created from an artificial alphabet and then testing for transfer to new but similar words. McCutcheon and McDowell (1969) repeated the study with real words as the stimuli.

The basic hypotheses in both studies were (1) that subjects would learn a list of dissimilar words (low intralist similarity) more

rapidly than a list of similar words (high intralist similarity), and (2) that because low intralist similarity would tend to encourage word identification on the basis of single letter cues, transfer to new but similar words would be poor for subjects who learned the dissimilar word list. The data from both studies supported the basic predictions: low intralist similarity resulted in more rapid acquisition but more incorrect identifications and false generalizations on transfer tasks. However, the results of both studies left certain questions unanswered and raised some new questions.

In the present study, the design of the two earlier studies was retained, but the method was expanded and more fully explicated. Specific changes incorporated in the present procedure were as follows: the words employed in all tasks were specified and varied systematically; subjects were pre-familiarized with the words in each of the three acquisition lists prepared to represent three levels of intralist similarity; complete data from the subjects who learned a medium similarity list were considered; and the number of serial learning trials was limited to 12, instead of 18, to reduce possible effects of serial-order learning. The purpose of the present study, then, was to seek more definite answers to the basic questions posed by McCutcheon and McDowell (1969): To what extent does intralist similarity affect kindergarten pupils' (a) rate of acquisition, (b) subsequent word recognition skills, and (c) tendency to make generalized responses to similar words?

METHOD

Subjects. The subjects were 54 kindergarten pupils from a semi-rural elementary school who had received no formal training in letter recognition. Eighteen of the pupils served in a preliminary study, and the remaining 36 participated in the main experiment.

Materials. All of the stimulus materials are shown in Table 1.

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Insert Table 1 about here
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The three acquisition lists were constructed to represent an increasing degree of intralist similarity. The four words in acquisition List 16-L comprise 16 letters and present no intralist similarity. List 8-L, medium similarity, includes eight letters; and List 4-L, high similarity, includes only four letters. Each word was printed in 1 1/2 inch, lower-case letters on a 3 X 5 card.

The word recognition task consisted of the original word and two variations: the original word with a different second letter and with a different final letter. Since the word needed only to be recognized, similarity of conformation of the substituted letters to the original ones was considered of greater importance than whether the change produced a real word. Each set of three words was printed in a column on an index card, with the position of the original word being varied in the columns in all three lists.

The generalization task was constructed to include four new four-letter words, each with one new letter substituted systematically across possible positions, for each list.

TABLE 1

Stimulus Materials for the
Acquisition, Recognition and Generalization Tasks

List	Acquisition	Recognition	Generalization
	bond	band, bonb	bonk
16-L	cage	cige, cagr	cape
(no	jump	jomp, jumg	pump
similarity)	list	last, lisf	lost
	ball	bell, bald	bull
8-L	fine	fane, finu	fire
(medium	lead	load, leah	leaf
similarity	nail	neil, nait	sail
	mate	mote, matn	made
4-L	meat	miat, meaf	seat
(high	tame	time, tamr	time
similarity	team	tram, tean	tear

Procedure. In order to assure that the words in the three acquisition lists would be equally familiar to all subjects, a pre-familiarization procedure was piloted with 18 subjects. Six subjects who initially could not read any of the stimulus words were assigned to each list. The words on the list were identified by the experimenter, a short explanation of each word was given, and each word was used in a sentence. Following this pre-familiarization, a sentence completion test was given orally. A target word from the list was deleted from each of four sentences. In place of the target word the subject was given a choice from all four words on the list and asked to indicate the appropriate one. No errors were made by any of the pilot subjects, so the pre-familiarization procedure was considered adequate to equate subjects' familiarity with the words on each list.

Of the 36 subjects in the main experiment, equal numbers of boys and girls were randomly assigned to learn each list. None of the subjects could read any of the words when they were first presented, and each subject was given pre-familiarization training to insure equal familiarity of the lists. After the pre-familiarization, each subject was instructed to attend to the word cards and repeat each word after it was pronounced by the experimenter. Acquisition trials then began, with each subject instructed to try to say the word before the experimenter for the remainder of the trials. Twelve trials were given in serial order, after which the cards were shuffled and presented in random order to a criterion of one correct anticipation of the entire

list. The cards were presented with an approximate 4-second response interval. Correct responses were verbally reinforced (e.g., "good"); incorrect responses were corrected. Both correct and incorrect responses were recorded.

After reaching criterion, each subject was given the word recognition task and instructed to indicate the original word, which was pronounced by the experimenter. Again, both correct and incorrect responses were recorded.

Finally, each subject was asked to read the words in the generalization task. Refusals, generalized responses, extra-list responses, and intralist responses other than the generalized words were recorded. A generalized response was said to have occurred if a subject responded with the original word from which the stimulus word varied by one letter.

RESULTS AND DISCUSSION

A univariate analysis of variance with orthogonal contrast was used to analyze all variables for list effect. List effect was measured in two ways: (1) comparison of the 16-L (no similarity) and the combined 8-L and 4-L (degrees of similarity) groups; and (2) comparison of the 8-L and 4-L groups, representing two degrees of similarity. Means and standard deviations are given in Table 2.

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Insert Table 2 about here
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The sex effect did not reach significance in any of the analyses.

TABLE 2

Means and Standard Deviations (in parentheses) for Trials to Criterion, Correct Word Recognition Responses, and Generalized Responses

Dependent Variable	Sex	List 16-L	8-L	4-L
Trials to Criterion	Boys	13.66 (1.21)	14.33 (1.50)	17.33 (3.67)
	Girls	14.17 (1.60)	15.00 (2.10)	21.67 (5.39)
	Combined	13.92	14.67	19.50
Correct Word Recognition Responses	Boys	2.00 (.89)	1.67 (1.03)	1.83 (1.17)
	Girls	.83 (.75)	1.83 (.98)	2.00 (1.41)
	Combined	1.41	1.75	1.91
Generalized Responses	Boys	1.33 (.52)	1.33 (.82)	.33 (.52)
	Girls	1.83 (1.60)	.83 (.75)	.50 (1.22)
	Combined	1.58	1.08	.41

The mean number of trials to criterion was 13.92 for the 16-L group, 14.67 for the 8-L group and 19.50 for the 4-L group. Significant differences were indicated by comparisons of the 16-L group and the combined 8-L and 4-L groups ($F = 9.04$, $df = 1/30$, $p < .01$) and of the 8-L and 4-L groups ($F = 15.8$, $df = 1/30$, $p < .001$). Analyses of correct responses in the 12 serial-presentation trials revealed no significant differences between groups, probably because all subjects quite quickly learned the serial order. However, differences in correct responses on Trial 13, the first random-order trial, paralleled the acquisition differences; means for the 16-L, 8-L and 4-L groups were 3.42, 3.17, and 2.0 respectively. In terms of trials to criterion, the present results are in line with those of the previous studies; the introduction of intralist similarity impeded the rate of acquisition. The additional finding is that the medium similarity group (8-L) responded more like the no similarity group (16-L) than like the high similarity group (4-L).

The mean number of correct responses to the word recognition task was 1.41 for the 16-L group, 1.75 for the 8-L group, and 1.91 for the 4-L group. While the trend was toward more correct responses with increasing intralist similarity, the differences were not significant. This finding is contrary to that of either of the two previous studies, which found that the high similarity group made a significantly greater number of correct word identifications than the no similarity group. Perhaps the nature of the stimulus list, of the word recognition

task, or the interaction is critical; or perhaps the greater number of serial presentations in the earlier studies had a significant effect. Further study is indicated.

The mean number of generalized responses, where the subject responded to a new word with the similar word from the acquisition list, was 1.58 for the 16-L group, 1.08 for the 8-L group, and .41 for the 4-L group. A comparison of the 16-L (no similarity) and the combined 8-L and 4-L (degrees of similarity) groups indicated a significant difference ($F = 5.71$, $df = 1/30$, $p < .02$); however, a comparison of the 8-L and the 4-L groups indicated no significant difference in generalized responses. These results are in line with the previous studies, which compared the two groups of no and high intralist similarity and found significantly more generalized responses for the high similarity group.

The two previous studies focused on the extreme conditions of no intralist similarity and high intralist similarity. In the present study, it is the behavior of the 8-L (medium similarity) group that is interesting to note. This group differed significantly from the 4-L (high similarity) group in speed of acquisition, being more rapid. However, it did not differ significantly from the 4-L group in the number of generalized responses given.

The implication in the previous studies was that by teaching highly similar words, we can prevent pupils from attending to single stimulus features of words (i.e., individual letters). The results

of this study seem to suggest that medium similarity is sufficiently effective for beginning readers, since it permits more rapid initial learning than high similarity and yet tends to foster more accurate subsequent word recognition than no similarity. Certainly, we are more likely to be able to write beginning reading materials with moderately similar words than with totally dissimilar words. It would seem then that moderate similarity is desirable both for effective initial learning and for pragmatic preparation of reading materials.

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