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ABSTRACT

Previous research has found that spoken rehearsal is superior to silent rehearsal during verbal discrimination learning. The frequency theory posits that verbal discrimination (VD) learning improves as the frequency differential between the correct and incorrect member of each pair increases. Erlebacher, Hill, and Wallace (1967) tested this hypothesis by administering a recognition memory test immediately following a VD task and found that subjects correctly identified more previously correct than incorrect VD items. The present experiments of the frequency theory were replicated in a manner similar to that of Erlebacher. A total of 80 paid college students (40 subjects in each experiment) were used. The stimuli consisted of 100 low frequency words from the Thorndike-Lorge tables; 50 of these words were randomly selected for a VD list. The results of the experiment clearly support the frequency theory prediction that pronunciation during informative feedback increases the differential between the correct and incorrect member of the VD pair, although it is unclear how this occurs. (RB)

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PRONUNCIATION EFFECTS IN VERBAL DISCRIMINATION LEARNING

by

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Report from the Project on
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Statement of Focus

Individually Guided Education (IGE) is a new comprehensive system of elementary education. The following components of the IGE system are in varying stages of development and implementation: a new organization for instruction and related administrative arrangements; a model of instructional programing for the individual student; and curriculum components in prereading, reading, mathematics, motivation, and environmental education. The development of other curriculum components, of a system for managing instruction by computer, and of instructional strategies is needed to complete the system. Continuing programmatic research is required to provide a sound knowledge base for the components under development and for improved second generation components. Finally, systematic implementation is essential so that the products will function properly in the IGE schools.

The Center plans and carries out the research, development, and implementation components of its IGE program in this sequence: (1) identify the needs and delimit the component problem area; (2) assess the possible constraints—financial resources and availability of staff; (3) formulate general plans and specific procedures for solving the problems; (4) secure and allocate human and material resources to carry out the plans; (5) provide for effective communication among personnel and efficient management of activities and resources; and (6) evaluate the effectiveness of each activity and its contribution to the total program and correct any difficulties through feedback mechanisms and appropriate management techniques.

A self-renewing system of elementary education is projected in each participating elementary school, i.e., one which is less dependent on external sources for direction and is more responsive to the needs of the children attending each particular school. In the IGE schools, Center-developed and other curriculum products compatible with the Center's instructional programing model will lead to higher student achievement and self-direction in learning and in conduct and also to higher morale and job satisfaction among educational personnel. Each developmental product makes its unique contribution to IGE as it is implemented in the schools. The various research components add to the knowledge of Center practitioners, developers, and theorists.

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Abstract

Previous research has found that spoken rehearsal is superior to silent rehearsal during verbal discrimination learning. Frequency theory can account for this finding if it is assumed that pronunciation leads to an even greater frequency differential between the randomly designated correct and incorrect item in each pair of words than occurs in silent performance. In two experiments in which an incidental recognition memory task was administered after verbal discrimination learning, support was found for this assumption. Further, in contrast with earlier research, it was found that the increased frequency differential was due at least as much to increased recognition of the previously correct verbal discrimination task items as to decreased recognition of the previously incorrect items.

I
Introduction

Frequency theory (Ekstrand, Wallace, & Underwood, 1966) posits that verbal discrimination (VD) learning improves as the frequency differential between the correct and the incorrect member of each pair increases. Erlebacher, Hill, and Wallace (1967) tested this hypothesis by administering a recognition memory test immediately following a VD task, and found that Ss correctly identified more previously correct than incorrect VD items.

It has also been reported that pronouncing the correct response aloud during informative feedback is superior to silent preformance (Underwood & Freund, 1968; Wilder, 1971). In order to account for this finding, frequency theory must predict an even greater frequency differential between the correct and incorrect members of each VD pair as a function of such pronunciation. The present experiments tested this hypothesis in a manner similar to that of Erlebacher et al.

II
Method

A total of 80 paid college students (40 Ss in each experiment) were used.

The stimuli consisted of 100 low frequency words from the Thorndike-Lorge tables (occurrence level of approximately once per four million words). Of these 100 words, 50 were randomly selected for a VD list. In each of the 25 pairs formed, one word was randomly designated as correct. The correct-incorrect (i.e., top-bottom) position order was randomly determined, with the restriction that the correct item would occur equally often in both positions. The 50 VD items were then re-randomized in a recognition list containing the remaining 50 words.

The lists were administered on a Stowe memory drum. The VD list was presented at a 2:2-second rate, and the presentation rate for the recognition list was 2 seconds per item.

Both experiments involved standard VD learning instructions (anticipation method) with five practice items, except that Ss were not informed about the number of VD trials, and they were not informed that a recognition test would follow. Also, in both experiments half the Ss were instructed to pronounce the correct (underlined) response during rehearsal (Group P) and the remaining Ss were given no pronunciation instructions (Group S). Immediately after the VD task, a recognition list containing the VD items, as well as words not previously seen, was administered.

The only difference between the two experiments was in the number of VD trials administered. In Experiment I there was one guessing trial and one test trial. In Experiment II only the one guessing trial was administered during the VD phase.

III
Results and Discussion

In Experiment I, Group P averaged 6.15 VD errors on the test trial, while Group S averaged 9.50 errors ($t(38) = 4.12$, $p < .001$), which substantiates previous findings (Underwood & Freund, 1968; Wilder, 1971) concerning the superiority of spoken over silent rehearsal. Table 1 shows the mean errors on the recognition task. Overall, there were more recognition errors on incorrect than correct VD items ($t(38) = 14.45$, $p < .001$), but a

TABLE 1
MEAN RECOGNITION ERRORS
IN THE TWO EXPERIMENTS

	"Correct" VD Item	"Incorrect" VD Item	I-C
Experiment I			
Group P	3.35	11.50	8.15
Group S	5.90	9.25	3.35
S-P	2.55	-2.25	
Experiment II			
Group P	4.00	13.70	9.70
Group S	6.40	12.15	5.75
S-P	2.40	-1.55	

comparison of the differences (I-C) in the two rehearsal conditions suggests that the effect was larger for Group P than S ($t(38) = 6.03$, $p < .001$). However, this difference could be explained by the fact that Group S made more overt errors (i.e., chose more incorrect items) during the VD test trial than did Group P. Therefore, the test trial was eliminated in Experiment II. Mean errors on the 25-pair guessing trial were statistically equal for the two groups (Group P = 13.60, Group S = 13.15, $|t| < 1$), and the recognition task yielded results similar to those of Experiment I, both for overall incorrect vs. correct recognition errors ($t(38) = 12.86$, $p < .001$), as well as for the comparative differences (I-C) in the rehearsal conditions ($t(38) = 3.29$, $p < .005$).

These results clearly support the frequency theory prediction that pronunciation during informative feedback increases the differential between the correct and incorrect member of a VD pair; however, it is still unclear how this occurs. Some data pertaining to the effect of pronunciation on recognition memory were recently reported by Hopkins and Edwards (1972). The _Ss_ were administered a single study list, with one group instructed to pronounce all the items in the study list, another group told to pronounce some but not other items, and a control group given no pronunciation instructions. Performance on a subsequent recognition test list was no better for the group that had pronounced all the items than for the control group. However, performance was significantly better for pronounced items than for unpronounced items in the "mixed list" condition. That is, when _S_ pronounced some but not other items in the same list, recognition performance was better for the pronounced items. Hopkins and Edwards also reported that performance on the pronounced items in the mixed list condition was no better than performance in the pronounce-all or control condition; rather, performance on the unpronounced items was significantly worse. Therefore, these authors concluded that "the effects of pronunciation are relative in the sense that _S_ must experience the contrast between pronounced and unpronounced items." Further, they concluded that there is no absolute improvement in recognition performance as a function of pronunciation, since their data from the mixed list pronunciation treatment indicated a decrease in performance for the unpronounced words rather than an increase in the scores on the pronounced items.

Applying the results of the Hopkins and Edwards (1972) recognition memory experiment to pronunciation effects in VD learning implies that pronunciation increases the frequency differential by preventing frequency units from accruing to the incorrect (unpronounced) item of the pair rather than by adding frequency units to the correct (pronounced) member. If this is true, then pronunciation has little to do with memory of the correct item, and it probably serves to direct attention away from the incorrect item. However, inspection of Table 1 shows that the differences between P and S (S-P) are at least as large for the correct items as they are for the incorrect items in a recognition study list may not be comparable to pronouncing the correct response during VD learning.

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