

Item recall in verbal-discrimination learning as related to pronunciation and degree of practice

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Incidental components, wrong (W) item and right (R) item free recall, of a verbal-discrimination (VD) learning task were related to type of item (W vs. R), the presence-absence of overt pronunciation during informative feedback, and degree of practice on the VD task. R recall exceeded W recall, but only in the absence of overt verbalization. Recall of both W and R items increased with degree of practice. Pronunciation was also accompanied by a decrease in proficiency of learning the VD task.

Recent analyses by Kausler (1966) and Kausler, Fulkerson, & Eschenbrenner (in press) have viewed a verbal-discrimination (VD) learning task as a Type 2 incidental learning situation (McLaughlin, 1965)—that is, one in which intentional and incidental learning occur simultaneously. The intentional component, of course, requires S to recognize right (R) items that are exposed contiguously with wrong (W) items in a list of W-R pairings. Ekstrand, Wallace, & Underwood (1966) have recently presented a frequency theory which seemingly accounts for the processes determining the proficiency of VD intentional learning. Incidental learning during VD practice probably includes a number of components, such as the learning of both W and R items qua responses and the learning of W-R and R-W pairings qua associations. These incidental learning components may affect the course of VD intentional learning, especially in transfer situations where the W-R pairings of a second list enter into an interference relationship with the W-R pairings of the first list (Kausler et al, in press).

The present study investigated the effects on VD incidental learning of several independent variables that have been previously demonstrated to affect the amount of incidental learning in other Type 2 situations. More specifically, the independent variables in this study were the type of item (W versus R), the presence-absence of overt pronunciation of W and R items, and the degree of practice on the intentional task (i.e., the VD recognition task), and the dependent variable was the free recall of items following the completion of VD practice. Mechanic (1962, 1964) has found that the amount of Type 2 incidental learning is a positive function of both the extent of the pronunciation required for the incidental components and the number of trials on the intentional task.

Method

The design was a 2 by 2 by 2 mixed factorial, with two between-group variables and one within-group

variable. The between-group variables were pronunciation (overt pronunciation (P) of W and R items during feedback exposures versus no (NP) overt pronunciation) and trials (5 versus 10) on the VD task; the within-group variable was the type of item (W versus R). The 40 undergraduate Ss were alternately assigned to the four groups (Groups 5P, 5NP, 10P, and 10NP) representing the combinations of the between-group variables.

A pool of 30 associatively unrelated words was selected from the Palermo & Jenkins (1964) word norms. These words were randomly assigned to two sets (A and B) of 15 words each, and, for purposes of greater generalization, two different lists of 15 pairs each were constructed from the sets. In one list Sets A and B words became W and R items, respectively; in the other list the set roles were reversed. A different random pairing of W and R items was used in each list. The lists were assigned alternately to the 10 Ss in each group. The specific list content was found to be unrelated to the dependent variables employed in this study and therefore eliminated from the statistical analyses reported below. Three different serial orders of the W-R pairs, with the left-right sequence of W and R items within a pair varying across the orders, were prepared for each list as controls for serial and spatial position cues. The W-R pairings were exposed by a Carousel projector onto a small screen at a 2/2 sec. rate and a 4-sec. intertrial interval. First the pair appeared, then the slide changed and the pair appeared again, this time with the R item underlined for purposes of informative feedback. Each S was given standard instructions regarding VD learning. In addition, Ss in Groups 5P and 10P were instructed to pronounce both the W and R items within a pair, in the order in which they appeared on the screen, during the feedback exposure. After the specified number of VD trials, each S was given a free recall task, without a time limit, in which both W and R items were recalled. The order of recall was counterbalanced, such that half of the Ss in each group were asked to recall W items first, followed by R recall, and the other half had the sequence reversed. Order of recall was unrelated to any of the dependent variables and was eliminated from the statistical analyses reported below.

Results and Discussion

Summary data for W and R recall are given in Table 1 for Groups 5P, 5NP, 10P, and 10NP. A mixed

Table 1.

Summary Statistics for Free Recall of Wrong (W) and Right (R) Items

Group	W Recall		R Recall	
	Mean	SD	Mean	SD
5P	7.10	2.33	6.90	1.85
5NP	6.60	2.32	8.40	2.32
10P	8.50	2.64	9.20	2.35
10NP	7.70	2.36	10.10	2.33

analysis of variance revealed significant main effects for trials ($F=6.84$, $df=1/36$, $p<.02$) and type of item (W vs. R) ($F=9.05$, $df=1/36$, $p<.01$); the main effect for pronunciation did not approach significance ($F<1$). The pronunciation by item interaction was significant ($F=5.61$, $df=1/36$, $p<.05$), but all other interaction effects fell far short of significance ($F_s<1$).

The significant main effect for trials and the absence of a significant trials by items interaction indicate that recall of both W and R items increased with degree of practice on the VD task. This finding of increased incidental learning with increasing practice on the intentional task is in agreement with that of Mechanic (1962) for a different Type 2 situation. The significant main effect for type of item reflects the overall superiority of R recall over W recall. This finding is not surprising in that R items are responded to more frequently as VD learning progresses than are W items (Ekstrand et al, 1966) and their availability for recall should be correspondingly greater. The significant pronunciation by item interaction suggests that overt verbalization is more effective in increasing recall for W items than it is for R items. From Table 1 it may be noted that overt verbalization was accompanied by an increase in W recall but a decrease in R recall, relative to the NP condition. A t-test analysis revealed that the difference in means between W and R recall was significant, in favor of R recall, under the NP condition (correlated t-test: $t=3.28$, $df=19$, $p<.01$) but not under the P condition ($t<1$). These differential effects for the P and NP conditions suggest that covert verbalization of highly meaningful R items normally occurs at a high frequency during feedback exposure

and that the requirement of overt verbalization of these items serves to reduce the total frequency of verbalization (overt and/or covert). On the other hand, covert verbalization of W items is likely to be at a lower level during feedback exposure, and the requirement of overt verbalization contributes a substantial increment to the total frequency of verbalization.

The effect of pronunciation on the intentional VD task was also determined. For this analysis only the first five trials of Groups 10P and 10NP were considered, thus yielding two groups (Groups P and NP) with $N=20$. The mean number of errors and the related standard deviation were 24.65 and 8.19 for Group P and 17.65 and 6.06 for Group NP, with the difference in means being significant ($t=3.07$, $df=38$, $p<.01$). Thus overt verbalization of W and R items was accompanied by a decrement in rate of VD learning. This finding is consonant with a frequency theory of VD learning. Increasing the frequency of responding to W items would be expected to make differential frequency of W and R items, the discriminative cue according to frequency theory, less pronounced.

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