Pronunciability rating and learning of doubly homogeneous paired-associate lists

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Forty Ss learned homogenous paired-associate lists consisting of 12 number-CVC trigram pairs equated for association value and familiarity. Two groups of 10 Ss each learned lists having low PR (easy to pronounce) response terms; 2 groups learned lists having high PR (difficult to pronounce) response terms. High and low PR groups did not differ significantly either in terms of mean number of trials to reach criterion or mean total number of correct responses over 25 trials. Rank-order correlations indicated that PR predicted neither the length of the integrative stage nor the total number of correct associations for these CVC trigrams. Results were discussed in terms of list homogeneity with respect to PR and trigram form-class, and in terms of the particular items comprising the lists.

Lindley (1963) reported a failure of pronunciability rating (PR) to predict ease of serial verbal learning of CVC trigrams when the association value (AV) and familiarity of these items were held constant. Since PR has ordinarily been a good predictor of ease of learning (Underwood & Postman, 1960; Underwood & Schulz, 1960) it was decided to test the generality of Lindley's (1963) findings by employing his materials as response terms in a paired-associate learning task. If groups learning paired-associate lists perform differentially on lists differing only in PR, additional support would be given the notion that PR is a major predictive attribute of verbal units. If such groups do not perform differently, the generality of Lindley's findings would be extended importantly.

Design and materials.

Four independent groups of Ss learned four different homogeneous paired-associate lists. Groups E1 and E2 learned lists whose response terms were identical to the CVC trigrams of the two lists of Lindley's (1963) Group 2 (easy to pronounce, mean PR = 3.36). The response terms of the lists of Groups D1 and D2 were identical to the CVC trigrams comprising the two lists of Lindley's Group 1 (difficult to pronounce, mean PR = 5.35). Response items of all four lists were of equal low AV and of equal low familiarity (see Lindley, 1963 for exact values). Five items were common to both lists of a given main PR group, as was the case in Lindley's study. Stimulus items of the four 12-pair lists were the numbers 1-12. Formal intralist similarity was roughly equal in all lists.

Subjects

The Ss were 40 male and female Introductory Psychology students, 10 of which were randomly assigned to each of the four groups.

Procedure

The lists were presented on a memory drum at a 2:2-sec. rate of presentation with a 4 sec. intertrial interval. The lists were learned to a criterion of one perfect recitation (spelled anticipations) or for 25 trials, whichever took longer. Thus, data for the number of trials to criterion and for the number of correct responses during 25 trials were collected.

Results and Discussion

Table 1 presents the means and SDs for the number of trials to reach criterion and for the number of correct responses during 25 trials for each of the four groups. In terms of trials to criterion Groups E1 and E2 did not differ reliably ($t = 1.81$, $df = 18$, $p > .05$), nor did Group D1 differ from D2 ($t = 0.87$, $df = 18$, $p > .05$); data of Groups E1 and E2 were hence combined, as were the data of Groups D1 and D2. Easy to pronounce items were not learned in significantly fewer trials than difficult to pronounce items ($t = 0.01$, $df = 38$, $p > .05$); in fact, performance was slightly superior in the high PR group.

In terms of mean numbers correct in 25 trials, again Groups E1 and E2 did not differ ($t = 1.44$, $df = 18$, $p > .05$); however, Groups D1 and D2 did differ significantly ($t = 2.20$, $df = 18$, $p < .05$). Groups E1 and E2 were thus combined and compared first with Group D1 then with D2 to yield respective insignificant ts of 0.26 and 1.56, $df = 28$ ($p > .05$ in each case). Though not significantly so, performance of Ss in Group E was superior to that of Ss in Group D1 but inferior to that of Ss in Group D2.

The results presented thus far are clearly consistent with Lindley's (1963) finding that PR did not predict ease of serial learning with these particular CVC trigrams. In addition, the present study extends the generality of Lindley's finding to the paired-associate situation.

As a further test of the ability of PR to predict ease of learning, rank-order correlation coefficients were

Table 1. Means and Standard Deviations of Trials to Criterion and Number of Correct Responses During 25 Trials

Group	Trials to Criterion		Total Correct	
	Mean	SD	Mean	SD
E1	35.5	13.7	124.2	51.2
E2	25.8	10.0	158.3	54.6
D1	31.2	13.2	135.6	56.0
D2	26.2	12.3	161.3	42.1
E (comb.)	30.6	12.5	141.2	53.0
D (comb.)	28.7	12.4	*	*

* *subgroup data not combined*

computed between the Underwood and Schulz PR value of a trigram and the number of the trial on which that item first occurred as a response, whether correctly or not. Postman (1961) suggests this latter measure as an indication of the length of the integrative or response-learning phase of paired-associate learning. Correlations were computed for trigrams within each of the four experimental groups as well as for the 38 different trigrams over all lists. Rank-order coefficients were also calculated between the PR of a trigram and the total number of times that trigram was given as a correct response—again within each group and over all groups. None of these 10 coefficients was significantly different from zero. Even over the entire range of PR employed in this study, PR predicted neither the length of the integrative stage nor the total number of correct associations for these CVC trigrams. These results, while again agreeing with those obtained by Lindley (1963), are quite contrary to those obtained by Underwood & Schulz (1960) in their extensive investigations of PR in paired-associate learning. How can this lack of agreement be resolved?

It seems possible that the use here and in Lindley's study of lists composed of items of the same form-class, i.e., CVC trigrams, may be a factor. Underwood and Schulz used lists heterogeneous with respect to form-class. Yet, as these authors (1960, p. 188) pointed out, the relationship between PR and learning remained strikingly high even when trigrams were grouped according to form-class—indeed, the highest correlations between PR and learning obtained within the CVC class. Another reason for the failure of PR to predict learning may be the relatively narrow range of PR sampled by Lindley (1963) and the present study; the difference between the mean PR ratings of the two main experimental lists is only 1.99. But again Underwood & Schulz (1960, p. 189) report a significant difference in the learning of two lists which differed in mean PR by only 1.88, frequency being constant for both lists. It should be noted, however, that neither of these Underwood and Schulz findings derived from designs employing lists homogeneous with respect to both form-class *and* PR. It may well be that PR would not be a useful predictor in such "doubly homogeneous" lists. An indirect test of this notion would involve replicating the present study using these identical items in mixed lists.

Half of the data of the present investigation are in accord with a suggestion of Underwood & Schulz (1960, p. 191) that the PR-learning correlation may be essentially zero within 12-item lists of difficult to pronounce items. This was indeed the case in Groups D1 and D2. However, correlations within Groups E1 and E2 were also essentially zero. It should also be pointed out that, while still insignificant, correlations between PR and learning within the D groups were somewhat higher than those within the E groups.

A final suggestion is that the real culprits here are the items themselves. In selecting items equal on two attributes (AV and familiarity) but differing on a third (PR), some items might be picked whose peculiar attributes make their scaling unreliable. A study apparently employing such unusual items was reported by Underwood & Schulz (1960, p. 196) in which neither PR nor AV showed a respectable correlation with learning. In the same study, items appearing on more than one list were learned rapidly in one, slowly in another. Such was also the case in the present study: learning of the five items common to two lists was not at all reliable; even when an item's relative PR rank within two lists was identical, differences in learning ranks of as much as seven obtained. This type of unreliability was greatest in the low PR lists. A replication of the present study using different response items is suggested in order to evaluate the contribution of such unusual items to this study's atypical results.

References

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Note

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