Associative originality training in children¹

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The effects of 1-, 3-, and 5-days of associative originality training on three criterion tasks was studied in 336 4th, 5th, and 6th grade children. Results indicated that while 3- and 5-days of training facilitated uncommon word association responding, no reliable facilitation of unusual uses and letter tasks was obtained. Scores on three personality scales were independent of all associative measures.

Studies by Maltzman and his associates have shown that it is possible to facilitate original responding on criterion tasks requiring no single correct solution by repeatedly presenting a list of words to Ss in training with instructions to give different responses on successive presentations of the list (Maltzman et al, 1960). Subsequent studies have reported successful replications with adult medical technicians and schizophrenics (Maltzman et al, 1961), equivocal results with normal high school Ss (Simon, 1961), and adolescent retardates (Penny & McCann, 1962), and negative results with normal and schizophrenic children (Maltzman et al, 1963). Among the reasons for failing to replicate these training effects with younger populations may be the greater variability of children's associative hierarchies, making it correspondingly more difficult to reinforce any single class of verbal behavior, e.g., uncommon responses. Thus the need for more extensive training procedures with such populations is suggested. To examine this possibility, the effects of 1-, 3-, and 5-days of originality training on criterion performance in three populations of children are investigated.

Method

Subjects. The Ss were 336 4th, 5th, and 6th grade children.

Stimulus Materials. All stimuli were read aloud by the E and Ss recorded their responses in a booklet provided. The free association stimulus words were culled from the Minnesota norms. There were 20 pretest words and 20 test words. Half of the words on each of these lists were high commonality (HC) words (range of dominant responses from 537-840) while the other half of the words were low commonality (LC) words (range of dominant responses from 33-201). As a second criterion measure, Ss were presented with the letters E, M, and B, one at a time, and asked to write as many words as they could which contained the given letters. Ninety sec. per letter was allowed. The letters were taken from norms provided by Underwood & Schulz (1960, Table 6) and were selected on the basis of their relative frequencies of occurrence in words of the English language. Guilford's Unusual Uses (UU) Test was employed as a third criterion measure. In this test, Ss are presented with the names of 6 objects

and are requested to give 6 uses for each of the objects presented. Two min. per object was allowed. Finally, three children's personality scales were administered to all Ss: a locus of control (LC) scale, a social desirability (SD) scale, and an intellectual achievement responsiveness (IAR) scale.

Procedure. The experimental design called for 6 treatment groups, 3 experimental (X) and 3 control (C) groups. With 3 grade levels orthogonal to each of these groups, the design was a 6 by 3 factorial with independent groups of Ss in each of the cells. All groups initially received a 20-word pretest free association list. Group C-1 was given, in order, the free association test list, the letters, and UU items immediately following this pretest list. Groups C-3 and C-5 received these same criterion tasks 2 and 4 days after receiving the pretest list, respectively. Group X-1 received only one day of training and was presented with the criterion tasks immediately following the last repetition trial. Training consisted of presenting the pretest list an additional 5 trials with instructions to give different responses on successive presentations of the list. Groups X-3 and X-5 received 3 and 5 days of training (5 trials per day) prior to receiving the test measures.

Scoring. The free association, letter, and UU responses were scored according to empirically-derived norms. Details have been described elsewhere (Maltzman et al, 1960).

Both fluency and originality scores were obtained for the letter responses. Fluency was defined as the total number of words written in 90 sec. The originality measure followed the empirical scoring procedure utilized with the word association responses.

Results and Discussion

Word Associations. An analysis of variance on the pretest scores revealed that only the main effect for Words was significant ($F=332.35$, $df=1/318$, $p<.001$). As expected, LC stimulus words resulted in more uncommon associations than did HC words.

An analysis of covariance on the test list, adjusting for pretest performance, revealed that only Groups ($F=5.76$, $df=5/317$, $p<.001$) and Words ($F=12.95$, $df=1/317$, $p<.001$) were significant. The results of t test on the adjusted group means (and adjusted for multiple comparisons where $p<.005$ for each contrast) indicated that Groups X-3 and X-5 were significantly more original than Groups C-3 and C-5, respectively; the X-1 vs. C-1 comparison fell short of significance ($.01 < p < .05$). The three X-groups, as well as the three C-groups, did not differ significantly among themselves. The adjusted means for Groups X-1, X-3, X-5, C-1, C-3, and C-5 were 46.79, 40.94, 34.31, 60.47, 56.40, and 53.34, respectively.

Fig. 1. Mean percentage of unique responses over successive training trials (days) for high and low commonality stimulus words.

Letters and Unusual Uses. Analyses of variance on the letter and UU fluency and originality scores failed to reveal any reliable effects due to treatment conditions; however, 6th graders ($M=11.82$) constructed significantly more words than 5th ($M=10.29$, $p<.05$) or 4th ($M=9.13$, $p<.01$) grade Ss and significantly more words were constructed with the letter E ($M=11.80$) than with the letters M ($M=9.50$) and B ($M=9.93$) ($p<.01$). Further, for both the letters and UU items, direct monotonic relationships were obtained between grade level and originality: for letters, the mean empirical frequency scores for 4th, 5th, and 6th graders were 26.62, 22.49, and 20.38, respectively; for the UU, the corresponding mean number of unique responses was 2.39, 2.84, and 3.42.

Repetitions. Separate Grades by Words by Trials analyses of variance were conducted on the (arc-sin transformed) percentage of unique responses emitted over successive training trials. Figure 1 presents the major results. Consistent with previous research, orthogonal comparisons revealed significant linear and quadratic components for all three trends ($p<.01$). No reliable grade differences were obtained.

Correlations and Factor Analysis. Product-moment correlations were computed between all of the criterion measures as well as between these measures and scores derived from the personality inventories. The obtained matrix was then factored into principal components and rotated by the normalized varimax method.

Based upon loadings of .30 or greater, results confirm the independence of the three criterion measures, i.e., each of the measures loads significantly on different

factors. Further, while the personality inventories load significantly on a single factor ($LC=.58$, $SD=.61$, $IAR=.78$), they show negligible loadings on all of the remaining factors. This finding supports previous research (Simon et al, 1965) in demonstrating that associative performance in children is unrelated to LC, SD, and IAR personality measures.

The present finding that 3- and 5-days of training facilitates uncommon word association responding in children provides some support for the contention that, relative to college Ss, more extensive training procedures are needed with younger populations. That the same training does not facilitate performance on UU and letter tasks, however, fails to support previous research with adults and extends this failure to a new open-ended criterion task. Further, if it is assumed that transfer performance is significantly related to performance at the conclusion of training, then inspection of the repetition data implies that asymptote is reached by the third day of training and that additional trials will not result in corresponding increments in criterion originality performance. These results, together with those obtained in other studies, thus suggest the existence of reliable developmental differences in responsiveness to associative originality training procedures.

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Note

1. Preliminary findings of this study were presented at the Midwestern Psychological Association Meetings in Chicago, 1963. The study was supported by USPHS Grant MH 06895. We wish to thank the DeKalb and University Schools for their cooperation in providing Ss.