The relationship between rote learning and mediated and nonmediated concept learning[1]

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In order to assess the hypothesis that the "response method" of concept learning is a rote learning task, performance on mediated and nonmediated variants of the response method were compared with each other and with performance on paired associate tasks. A low but significant relationship was found between mediated and nonmediated concept learning but little relationship was found between paired associate learning and performance on either concept learning task.

The frequently used response method of concept learning has been said to be an extension of the paired associate technique and a variant of rote learning (Coleman, 1964; Deese & Hulse, 1967). In this procedure, Ss are presented with a series of stimuli and are required to label each stimulus with the appropriate concept name. The assumed equivalence of the paired associate and response method procedures places the status of the latter in an ambiguous position, since the simple, rote learning measured by the paired associate method is neither simple (McGuire, 1961; Underwood & Schulz, 1960), nor rote (Battig, 1966; Dallett, 1964), nor even learning (see Mandler, 1967, pp. 9-11).

In order to assess the relationship between these tasks, mediated and nonmediated concept learning variants of the response method were compared with each other and with performance on standard paired associate tasks. If the response method is similar to the paired associate technique, a high degree of relationship between performance on these tasks may be expected, particularly between nonmediated concept learning and paired associate learning.

Design

The 115 undergraduate Ss learned one of two paired associate lists and a concept list (Mednick & Freedman, 1960). The first paired associate list (PAL-1) was designed to facilitate the attainment of the concept "white" in subsequent concept learning. On this list, the learning of four of the 12 word pairs facilitated the attainment of "white" in later concept learning. The remaining word pairs on this list were neutral with regard to "white." The second paired associate list (PAL-2) was similarly designed but facilitated the attainment of the concept "soft." The concept list consisted of 12 nouns which could be placed into three groups, each of which contained four nouns which were instances of a common concept. The Ss' task was to learn the three adjectives ("white," "soft," and buffer concept "large"), each of which described a different group of four nouns. Facilitation and nonfacilitation concept learning scores were obtained for each S.

Procedure

The Ss learned PAL-1 or PAL-2 to a criterion of two successive perfect trials. All Ss then learned the concept list to a criterion of one perfect performance or were terminated at 20 trials. The stimuli were presented at 4 sec intervals and were projected on a screen by a Kodak Carousel Slide Projector connected to a time interval generator. Three orders of each paired associate list and five orders of the concept list were employed and kept constant for all Ss.

Results and Discussion

Four indices of paired associate learning were employed: (a) trials to learn all pairs; (b) number of omission errors; (c) number of incorrect responses; and (d) total number of errors ($d = b + c$).

Six indices of concept learning were used: (a) trials to the first correct response; (b) trials from the first correct response to concept attainment; (c) total trials to concept attainment ($c = a + b$); (d) number of omission errors; (e) number of incorrect responses; and (f) total number of errors ($f = d + e$).

The product-moment correlations among indices of learning for the 56 Ss who learned PAL-1, the facilitated concept "white," and the nonfacilitated concept "soft" were computed and evaluated for significance. No significant relationship was found between paired associate learning and performance on nonmediated concept learning. However, a low but significant relationship was found between indices of paired associate learning and performance on mediated concept learning. These correlations are presented in Table 1.

Table 1.
Correlations Between Indicies of Paired Associate Learning and Mediated Concept Learning.

	Paired Associate Learning			
Med CL	TR	OM ER	INC R	TOT ER
TR TO	.25	.40**	.06	.32*
TR FR	.30*	.21	.30*	.28*
TOT TR	.28*	.23	.25	.28*
OM ER	.26	.36**	.07	.29*
INC R	.01	.05	.02	.05
TOT ER	.22	.32*	.08	.27*

*$p < .05$
**$p < .01$

Table 2.
Correlations Between Indices of Mediated and Nonmediated Concept Learning.

Nonmed CL	Mediated Concept Learning					
	TR TO	TR FR	TOT TR	OM ER	INC R	TOT ER
TR TO	.05	.12	.08	.15	-.10	.04
TR FR	.12	.31*	.32*	.29*	-.06	.20
TOT TR	.07	.29*	.31*	.28*	-.03	.21
OM ER	.18	.24	.25	.61***	-.38**	.25
INC R	-.07	.04	.00	-.33	.37**	-.06
TOT ER	.10	.22	.19	.27	-.07	.17

*$p < .05$
**$p < .01$
***$p < .001$

The correlations for the 59 Ss who learned PAL-2, the facilitated concept "soft," and the nonfacilitated concept "white" indicated no significant relationship between paired associate and facilitated concept learning. However, low but significant correlations ($p < .05$) were found between total errors in paired associate learning and total trials, omission errors, and total errors in nonfacilitated concept learning.

It appears, then, that a low but significant relationship is in evidence between the learning of the concept "white" and paired associate learning, with the effect most pronounced under conditions of concept facilitation. No relationship was found between the learning of "soft" and paired associate learning.

Table 2 indicates the relationship between facilitated and nonfacilitated concept learning for each of the six performance measures for Ss who learned PAL-1. These data may be summarized in the following manner:

(1) There is a low but significant relationship between indices of mediated and nonmediated concept learning. This low degree of relationship is somewhat surprising when it is noted that Ss, Es, and methods of presentation were the same in both conditions and that both concepts were learned simultaneously in a relatively large sample study.

(2) The tendency of Ss to make omission errors on one task was found to be highly related to the tendency to make omission errors on the other task ($r = .61$, $p < .001$). Omission errors on one task were also inversely related to incorrect responses on the other task ($r = -.38$, $p < .01$). Trials from the first correct response to concept learning were found to be more highly related to other performance measures than trials to the first correct response.

A similar low but significant relationship between facilitated and nonfacilitated concept learning was found for Ss who learned PAL-2, but a more consistent pattern of significance was found for total trials, omission errors, and total errors.

In summary, the data indicate a low degree of relationship between paired associate and concept learning. These results do not support the hypothesis that the nonmediated form of the response method is a variant of rote learning. A low but significant relationship was found also between mediated and nonmediated concept learning. The findings suggest also an interaction of concepts, conditions, and performance indices.

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