previous study (Delin, 1968) it was found that ratings of descriptions of images for the degree to which they conformed to the bizarre-image mnemonic instructions related positively to recall performance.

Apart from the anomalous performance of the f-instruction Ss, the results of the present study suggest that as the mnemonic instructions become more complete, the differences between control and experimental Ss become greater in terms both of level of performance and of relative preponderance of omission and commission errors. The differences in error type did not appear in the relearning data, but this fact is not easy to interpret, since these data confound recall and relearning per se. Not enough errors were made in relearning for it to be possible to analyze these factors separately. However, even if the mnemonic/control difference in predominant error type only occurs on learning, it suggests that mnemonic learning is different from rote learning in kind as well

as in degree—an observation which is interesting in view of the fact that Ss frequently, and spontaneously, report that mnemonic learning “feels” quite different from “ordinary” learning.

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Vermont were tested in one of three conditions, 16 Ss each. There were three decks of 32 index cards, each deck having all combinations of five two-valued dimensions, so that each card bore five words, one from each dimension. The dimensions and values are given in Table 1.

Conditions were ID (intradimensional shift), ED (extradimensional shift), and control (shift to all new dimensions). For the preshift task, ID and ED groups had the experimental deck and controls the control deck. Then all groups had the postshift deck. Both decks for ID and ED conditions had the same dimensions. The ID group shifted to new values on the same dimension as before, while the ED group shifted to new values on another of these dimensions. Controls shifted to an entirely new set of dimensions. Each S was assigned a condition and solution in the order of his appearance. Cards were shown singly and S was to name the correct word on each, and E indicated whether the response was right. After 10 consecutive correct responses S was switched to the postshift deck and taken to the same criterion.

RESULTS

Preshift mean trials up to the criterial run were 4.3, 4.5, and 3.9 for ID, ED, and controls, respectively. A nonsignificant F indicated comparable performances. Postshift mean trials were 0.0, 2.8, and 1.7 for ID, ED, and controls. Since the ID group had zero variance, the Kruskal-Wallis nonparametric ANOVA was used and showed $H(2) = 27.0, p < .001$.

DISCUSSION

Since the ID group showed positive transfer and the ED group gave negative transfer, this supports a mediational interpretation. However, it is conceivable that the results came about by direct free associations between the preshift and postshift words, tending to facilitate ID and hinder ED performance. To check this, 100 new Ss were asked to give free associates to all words from both preshift decks. Out of the 2,000 responses a total of only nine (0.4%) were postshift words, whereas 20% were appropriate dimensional terms. Thus, the direct association possibility is unlikely. It is concluded that the data, coming from a design free of the aforementioned biases, strongly support a mediational interpretation.

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NOTE

1. Miss Jean Stables collected the data. The paper was written during the author's tenure as a NIH Special Fellow at the Institute of Human Learning, Berkeley.

An Improved discrimination-shift design¹

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A discrimination-shift experiment was performed whose design was free of several sources of bias. All postshift values differed from preshift values, and the stimuli were words. Three groups were used: the ID, shifted to the same dimension; the ED, shifted to another dimension; and the control, shifted to entirely new dimensions. Results showed positive transfer for ID and negative for ED, strongly supporting a mediational interpretation.

A recent review of shift paradigms testing single-stage vs mediational interpretations of human discrimination learning, stressed several potential biases (Slamecka, 1968). These involved intermittent reinforcement, shift detectability, obviousness of solution, stimulus novelty, and negative transfer. An improved design was suggested, where all postshift dimensions have values different from the preshift task, and the stimuli are words. The present experiment demonstrates such a design.

METHOD

Forty-eight students at the University of

Table 1
Makeup of Decks. Each Card had a Word from Each Dimension.

Preshift				Postshift	
Control		Experimental			
football	tennis	monkey	lion	raccoon	deer
sulphur	chlorine	radish	carrot	potato	lettuce
purple	white	Chicago	Atlanta	Baltimore	Omaha
triangle	hexagon	trumpet	violin	piano	guitar
Chevrolet	Pontiac	William	Henry	Edward	Matthew