

# Verbal conditioning: Reinforcement or discriminability?'

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*Groups consistently reinforced for either emotional or non-emotional words showed no verbal-conditioning differences, but both groups subsequently showed facilitated tachistoscopic recognition of emotional words as compared with inconsistently reinforced or unreinforced control groups. These results indicate that increased discrimination of the reinforced response class provided by its consistent pairing with the reinforcing event, rather than actual strengthening of this response class through reinforcement, may be the basic process operating in verbal-conditioning situations.*

Although several previous studies have attempted to demonstrate an increase in emotionally-charged verbal output resulting from its prior reinforcement under verbal-conditioning procedures, the evidence for such conditioning has been neither impressive nor devoid of artifacts leading to alternative interpretations. For example, Ullmann, Weiss, & Krasner (1963) found little if any increase in emotional-word responses as a result of their reinforcement during a verbal-conditioning period, although such "conditioning" subsequently led to facilitated recognition of threatening stimuli on a perceptual-defense test (McGinnies, 1949). The present experiment was designed initially to replicate the Ullmann et al study with several added control groups, and also with a better controlled and hopefully more sensitive verbal-conditioning procedure as compared with their modified TAT task. Of particular interest was the possibility that their finding of improved recognition of emotional words might reflect the increased discriminability of the latter as a separate response class resulting from consistent pairing with an allegedly reinforcing event, rather than the actual strengthening of such responses by reinforcement presumed to be responsible for verbal conditioning.

## Method

The Ss were 40 introductory psychology students fulfilling a course requirement through their participation, who were assigned to one of five groups of eight Ss each. Except for Group X, which experienced no verbal conditioning, all groups received exactly the same verbal conditioning task and differed only with respect to reinforcement contingencies. Groups E-100 and N-100 received consistent reinforcement for the use of emotional and neutral words, respectively. Group 50-50 was reinforced equally often for both types of words, whereas Group 0 received no reinforcement whatever on the verbal-conditioning task.

Materials for verbal conditioning were 24 emotional and 24 neutral words selected from Levinger & Clark

(1961), which were arbitrarily divided into eight sets each containing three emotional and three neutral words. All words of each set were typed in two three-word columns on a single 3 x 5 in. card. Through a Latin-square counterbalancing procedure, six different orders of words within each card provided that each word appeared once in each card position, and also that each type of word appeared in each position equally often across the eight cards for each S. All eight cards were presented in the same order to each S. All Ss were instructed to form verbally six sentences for each card, using each word on the card in only one sentence, and were also told that their performance would "have something to do with the order in which you use the words on each card."

Reinforcement in the form of "very good" was provided vocally by E following any of the first four sentences from each card that contained an emotional word for Group E-100 or a neutral word for Group N-100. For Group 50-50, alternating cards involved reinforcement for emotional and neutral words, so that each type was reinforced on four of the eight cards. Through this procedure, each S was assured at least one reinforcement for each card, but number of reinforcements was otherwise dependent entirely on the order in which the six words were used.

Immediately after verbal conditioning, the same tachistoscopic recognition test was given to all groups (including Group X). This consisted of seven threatening emotional five-letter words (anger, bitch, crime, death, dream, fight, and penis), and seven neutral words with the same length and initial letters (apple, bring, carry, downy, dusky, flier, and piano), obtained from Bruner & Postman (1947) and the Jenkins, Russell, & Suci (1958) semantic atlas. Each word was presented singly under self-paced conditions via Lafayette Electro-Tach individual tachistoscope, beginning with two presentations at .01 sec. and continuing through two successively slower exposures at .02, .04, and .1 sec. until S had correctly identified the word. When necessary, each unidentified word was repeated at a 1 sec. exposure until correct recognition had been achieved. Half of the Ss were given the 14 words in the same unsystematically intermixed order, whereas the remaining Ss received the inverse of this order.

## Results

Verbal-conditioning performance was measured in terms of order of usage of emotional and neutral words within each card, with numerical scores of 4, 3, 2, and 1 assigned respectively to the first through

Table 1. Mean Total Trials to Recognition Summed Over All Words

Performance Measure	Group				
	E-100	N-100	50-50	0	X
Emotional (E)	39.6	39.6	57.0	52.3	52.9
Neutral (N)	38.6	40.0	48.0	46.1	47.4
Total (E + N)	78.3	79.6	105.0	98.4	100.3
Difference (E - N)	1.0	-0.4	9.0	6.1	5.5

fourth words to be used (the fifth and sixth words both were scored zero). Performance across the eight successive cards was closely comparable for all groups, with Group E-100 showing if anything a slight decline in order of usage of emotional words relative to Groups N-100, 50-50, and 0. Thus reinforcement for emotional words produced no evidence whatever for conditioning of such words, despite the probable greater sensitivity of the present numerical scoring procedure as compared with previous verbal-conditioning performance measures.

As shown in Table 1, however, the groups did differ significantly in tachistoscopic recognition of the emotional words. In support of previous results (e.g., McGinnies, 1949), Groups 50-50, 0, and X all required more total presentations (trials) before recognizing the seven emotional than the seven neutral words. However, both Groups E-100 and N-100 displayed recognition of emotional words that was equivalent if not slightly superior to neutral words. Table 1 further shows that this relative facilitation for emotional words was if anything slightly greater for Group N-100 than E-100, even though it had been the neutral rather than emotional words that were reinforced for the former group. Groups E-100 and N-100 also showed a slight facilitation for recognition of neutral words relative to the other three groups, although this difference did not approach significance ( $p > .10$ ). However, each of the other measures in Table 1 (emotional words, total words, and emotional-neutral differences) revealed significant ( $p < .01$ ) differences between Groups E-100 and N-100 combined as compared with the other three groups.

#### Discussion

The equivalence of Groups E-100 and N-100 both in verbal-conditioning and subsequent recognition performance, and the facilitated recognition of emotional words shown by both relative to the other three groups, clearly demonstrate that "reinforcement" in the present experiment had not served to strengthen the reinforced

response class. For Group N-100, facilitated recognition was shown instead for the nonreinforced emotional word class. The necessary condition for improved recognition of emotional words thus appears to be the consistent pairing of the reinforcing event with either emotional or nonemotional words, presumably because this makes it easier for S to identify and discriminate a distinct class of emotional words. Such an interpretation is further indicated by the fact that inconsistent reinforcement in Group 50-50 for both emotional and neutral words had actually produced insignificantly poorer recognition of emotional words than in Groups 0 and X, presumably because the pairing of reinforcement with both types of words had obscured the distinction between them.

The smaller size, greater homogeneity, and consequent easier identifiability of the present emotional-word class relative to the amorphous class of nonemotional or neutral words is probably responsible for the limitation of the present differences to emotional words. Smaller size and easier identifiability of the reinforced than the nonreinforced response class has similarly been characteristic of the bulk of verbal-conditioning experiments. Thus much of the evidence allegedly demonstrative of verbal conditioning may instead be attributable to the discriminability phenomenon shown in the present experiment. Only through the inclusion of a group reinforced consistently for the negative or null response class (like the present Group N-100), and the demonstration that such a group differs significantly from the reinforced conditioning group, can the results be offered as demonstrative of conditioned strengthening of a reinforced response class.

#### References

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#### Note

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