Journal of Personality and Social Psychology
1970, Vol. 14, No. 4, 321–328

POSITIVE AND NEGATIVE ATTITUDINAL AFFECT ESTABLISHED BY CLASSICAL CONDITIONING[1]

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By pairing meaningful adjectives with the onset and offset of electric shock, an attempt was made to establish two attitudes, one based on negative affect and one based on positive affect, within each subject. Words paired with the onset of shock were evaluated more negatively; words paired with the offset of shock, more positively. Conditioned affect also generalized to words similar in meaning. The results were much stronger for subjects who showed independent physiological evidence of conditioning and for the adjective which was initially more neutral in evaluation. The success of an elaborate cover story, including a disguised posttest given by a second experimenter, suggested that the demand characteristics of the experimental situation could not account for the data.

Attitudes are typically defined as predispositions to respond to some class of stimuli with certain classes of responses. Three major classes of responses are cognitive, affective, and behavioral (Rosenberg & Hovland, 1960). Thus when we refer to an individual's attitude, we refer to certain regularities of his thoughts, feelings, and actions toward some aspect of his environment (cf. Secord & Backman, 1964).

Traditionally, social psychology has been concerned both with the understanding of attitude change and with the understanding of attitude formation (cf. Allport, 1935). Research, however, has generally emphasized the study of attitude change rather than attitude formation. Research has also focused on changing the cognitive component of an attitude rather than its affective component. Although Rosenberg (e.g., 1960) has used the technique of hypnotic suggestion to change the affective component of an attitude, little information exists concerning the establishment of an attitude based primarily on affect.

The study of attitude formation, however, has not been entirely neglected in psychology. Following Doob's (1947) assertion that attitudes are learned mediating responses, investigators (e.g., Eisman, 1950; Das & Nanda, 1963; Staats & Staats, 1958) have used a variety of classical conditioning paradigms to establish attitudes in the laboratory. Two procedures, which Staats (1967) has called "higher-order" and "first-order" classical conditioning paradigms, have been used to establish attitudes based on affect. Studies (e.g., Blasford & Sampson, 1964; Cohen, 1964; Goots & Rankin, 1968; Staats & Staats, 1958) which use the "higher-order" paradigm pair stimuli (usually neutral words or nonsense syllables) with a series of words (usually adjectives) which have evaluative meaning. Studies (e.g., Staats, Staats, & Crawford, 1962; Stagner & Britton, 1949) which use the "first-order" paradigm pair a conditioned stimulus (CS) with the onset of an aversive unconditioned stimulus (UCS—usually electric shock). The typical finding in studies using both paradigms is that the neutral stimulus, which was paired *either* with a series of unpleasant adjectives or with shock, comes to be evaluated more negatively. This finding has supported the assumption that negative affect is associated with a series of unpleasant adjectives and with shock and the

[1] This research was supported in part by National Science Foundation Grant GS737 to Charles A. Kiesler. The research was conducted while Mark Zanna held a Predoctoral Fellowship from the National Science Foundation and Paul A. Pilkonis held an undergraduate summer fellowship from the National Science Foundation. The authors gratefully acknowledge the assistance of Irving Janis who permitted the use of his laboratory and his physiological recording equipment. A portion of this paper was presented at the meeting of the Eastern Psychological Association, April 1968.

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hypothesis that attitudes can be established by classical conditioning.

The data generated by these procedures, however, have a plausible alternative explanation. There are a variety of ways by which a procedure may obtain results spuriously. In the case of a simple conditioning paradigm, Kiesler, Collins, and Miller (1969) have suggested that because the hypotheses are often direct and uncomplicated (especially to introductory psychology students), subjects may easily be able to detect what they are expected to do in the experiment and then simply comply with the experimenter's presumed wish. This possibility is increased when the same experimenter performs the conditioning phase of the experiment and then administers the posttest in the same session. To the extent, then, that subjects become aware of the expected outcome of the experiment, an "experimenter demand" explanation can account for the results (Orne, 1962). Rephrased, this alternative explanation suggests that the experimental procedure has unwittingly given the subject an idea of what he "should do." The subject then merely complies with this presumed demand of the situation.

Page (1969) has recently suggested (and provided evidence) that the results of the higher-order conditioning paradigm "are entirely artifacts of demand characteristics [p. 185]." An internal analysis of his data revealed that only those subjects who reported awareness of the CS-UCS contingencies, and before the posttest, awareness of how the experimenter expected them to evaluate the CSs, showed a conditioning effect. In contrast, subjects either unaware of the contingencies or aware of the contingencies, but unaware of the demands, did not show any evidence of conditioning. Although Staats (1969) has challenged the interpretation advanced by Page because postexperimental questionnaires may "*produce* varying levels of 'awareness' as well as measure it [p. 189]," these results remain, nevertheless, consistent with an "experimenter demand" explanation. In any case, all studies which have used a classical conditioning paradigm to establish attitudes are unable to rule out this alternative explanation. (For a more complete discussion of this problem, see Kiesler et al., 1969.)

The major purpose of the present experiment was to establish an attitude based on negative affect in an experimental situation in which the demand characteristics could not account for the results. A first-order conditioning paradigm was employed. In the procedure a meaningful adjective was paired with the onset of shock. The main hypothesis was that this adjective would come to be evaluated negatively, thereby replicating the results of previous studies (e.g., Staats et al., 1962).

In order to make the demand characteristics of the experimental situation irrelevant to the hypothesis, an elaborate cover story was created. Besides providing a plausible explanation for the experiment, the cover story fulfilled two other important functions: first, it allowed the contingencies of the pairings between the onset signal word and the shock to be made explicit to the subject from the beginning without arousing any suspicion as to the real purpose of the experiment; second, it allowed a second experimenter, blind to condition, to administer the posttest in a supposedly unrelated study.

In addition to establishing an attitude based on negative affect, an attempt was also made to establish an attitude based on positive affect within the same subject. Although past research on this problem has been rather limited, a behavior-therapy technique reported by Wolpe and Lazarus (1966) suggested a possible procedure.[3] These authors conditioned "anxiety-relief" responses in neurotic patients by pairing the word "calm" with the offset of shock. They suggested that "if an unpleasant stimulus is endured for several seconds and is then made to cease almost immediately after a specified signal, that signal may become conditioned to the changes that follow cessation of the uncomfortable stimu-

[3] Razran (1938, 1940) has used a so-called luncheon technique, in which he paired stimuli (e.g., political slogans) with the positive affect associated with eating a free lunch. Dabbs and Janis (1965), however, presented data which indicated that Razran's effect was not due to the conditioning of positive affect. Their alternative explanation is that "the consumption of proferred food induces a momentary mood of compliance toward the donor that is strongest at the time the food is being consumed but that decreases in strength rapidly after the food has been consumed [p. 141]."

lus [p. 149]." Wolpe and Lazarus reported that their patients appeared to experience these changes as a profound feeling of relief and therefore suggested that "anxiety-relief" conditioning "occurs in those patients who experience some degree of *emotional* disturbance (as opposed to mere sensory discomfort) in response to the electric shocks [p. 149]."

Animal research suggested another possible procedure for conditioning positive affect. For example, Rescorla and LoLordo (1965) found that a CS which informed their dogs that an expected shock would not occur came to inhibit fear when it was later introduced in an avoidance situation.

To test the possibility that positive affect is associated with the offset of pain and/or the offset of a danger period, a second signal word was incorporated in the procedure. This adjective signaled that shock would not follow. Two kinds of trials were actually employed. Following Wolpe and Lazarus (1966), on some trials this offset word signaled that shock was over. Thus the word was paired with the cessation of pain produced by shock. On other trials shock was not delivered. Following Rescorla and LoLordo (1965), on these trials the offset word signaled that shock would not occur. Thus the word was also paired with the cessation of danger aroused by the expectation of being shocked. The second hypothesis, then, was that a word paired with the cessation of pain and danger would come to be evaluated positively.[4] Together, the two hypotheses suggest that a classical conditioning paradigm could be used to establish two distinct attitudes based on affect within a single subject. One attitude would be associated with negative affect, the other with positive affect.

If affect could be conditioned, exploration of the power of the conditioning technique in terms of generalization effects seemed desirable. For this purpose, subjects evaluated concepts similar to the adjectives used as signal words as well as these adjectives modifying various nouns.

[4] A test of the difference between the cessation of pain and the cessation of danger was not made in the present study. Instead it was assumed that the combination of the two kinds of trials would add to the power of the offset effect since both cessations may be associated with relief or anxiety reduction.

Finally, in order to have independent evidence of conditioning, a physiological response (galvanic skin potential or GSP) was continuously recorded. Since autonomic arousal is generally assumed to accompany affect arousal, it seemed reasonable to expect that attitudes would be established to the extent that autonomic arousal was conditioned (cf. Staats et al., 1962).

METHOD

Subjects

Fifty female subjects,[5] ages 17–23, were recruited from sign-up sheets at Yale University and each was paid $2.50 for the hour and a half experiment. Three subjects were eliminated from the analysis because they failed to complete the posttest correctly.

Overview

Each subject was given an elaborate cover story. Subjects then received 25 shock trials arranged into four blocks. Each trial was initiated by the reading of an adjective (the onset signal word) and was terminated by the reading of a different adjective (the offset signal word). Next a second experimenter, blind to experimental condition, administered a semantic differential posttest in a supposedly unrelated study. Finally, subjects described the purpose of both experiments on an anonymous "departmental questionnaire" and were debriefed by the first experimenter.

Cover Story

Each subject was immediately seated in a chair, and as the experimenter placed various recording electrodes on her arms, he explained "our physiological equipment" (e.g., the heart-rate or EKG and GSP recording electrodes and the polygraph machine). After the electrodes were in place, the experimenter began by explaining the contrived purpose of the study.

> Our long range goal is to develop a more sensitive and instantaneous physiological measure than the old standard ones, like heart rate. . . .

The experimenter then explained that electric shock would increase heart rate, but that he was hoping that the shock's effect on GSP would be more consistent within and across persons, more instantaneous, and more resistant to adaptation effects. Finally, the experimenter justified the random contingencies of the conditioning procedure so that these contingencies would seem reasonable to the subject.

> In order to be precise in our physiological measurements, we have created blocks of shock trials with everything we could think of randomly determined. This, we hope, will ensure random physiological

[5] Pretesting indicated that female subjects were made more anxious by the shock than male subjects.

activity when you're not getting shocked and a precise response to shock when the shock is on.

Conditioning Procedure

Twenty-five conditioning trials were arranged into four blocks. Shock was delivered manually by the experimenter in 1-second bursts. The signal words were recorded on tape and the block of trials began by simply turning on the tape recorder. The instructions for the first block of trials were as follows:

> Each trial will begin with a signal word. There will be a short pause and then you will receive a few shocks. Actually, you will receive from 1 to 9 shocks. The number on any one trial has, of course, been randomly determined. You will know when you are receiving the last shock of the trial because a second word will indicate the end of each trial.

Subjects were then told what the signal words would be. Thus the instructions made the contingencies between the signal words and the shock explicit to each subject from the beginning. Moreover, these contingencies were completely justified within the context of the experimental situation. Each subject was told that she was supposed to relax between the shock trials (in order to get "a base-line measure of physiological responding"). Thus it was important for her to know when the shock was imminent and when the shock was completed. The signal words were supposedly introduced for this purpose.

The instructions for the remaining three blocks added three qualifications. First, each trial would "begin with the reading of a list of words." The onset signal word would be read only after a random number of words (1–11) had been read. These words were added to ensure that the subject paid close attention to the specific onset signal word. Second, there would be a random pause (1–9 seconds) between the onset signal word and the shock. The random pause was added to increase the anxiety-arousing potential of the onset signal word. Finally, the subjects were informed that there would be some trials, randomly determined, on which shock would not occur. On these trials, the offset signal word would simply be read after the random pause. As always, the offset signal word would indicate that the trial was over and that a rest period had begun. Six nonshock trials were included in the last 20 trials so that the offset signal word could be paired with the cessation of a danger period produced by the expectation of being shocked.

Independent Variables

Three experimental conditions were created. In one condition, the adjective "light" signaled the onset of shock and "dark" signaled shock offset (the light-on/dark-off condition). In the second condition these words were reversed (the light-off/dark-on condition). The onset and offset signal words in the control condition were "begin" and "end."

Physiological Conditioning

Although subjects did have EKG and GSP recording electrodes, only GSP was recorded (cf. O'Connell & Tursky, 1960). A reliable GSP response on the six nonshock trials was taken as independent evidence for conditioning. Learning curves over these six trials were not constructed for two reasons. First, subjects had received several trials before the first nonshock trial. Second, subjects were informed of the contingencies between the CSs and the UCS beforehand. The fact that subjects were able to verbalize the CS-UCS relations in advance suggests that any "conditioning" effect may not be due to a classical conditioning process, but due to these verbalizations per se. These possibilities are confounded in the present design. It must be noted, however, that previous studies using classical conditioning paradigms to establish attitudes allowed normal adult human subjects to verbalize the CS-UCS relations. This relational learning (as distinguished from classical conditioning) can never be entirely ruled out unless no effect is produced.

Posttest and Dependent Variables

After the fourth block of trials (or 25 trials), the experimenter explained that he wanted to give the subject an extra long rest period before the next block of trials. He explained:

> In order to see if your heart rate and GSP responses to shock have been adapting out, I'm going to give you a 15-minute rest period before the next block of trials. Hopefully, any adaptation will be eliminated by a rest period this long . . . . To take your mind off the situation during this period, I've been letting subjects either read a magazine or take part in another study a student down the hall is running . . . .

The experimenter left the room and returned within 2 minutes with the posttester, who appeared to be arranging his materials. After introducing the posttester to the subject and promising to return in 15 minutes to "finish up," the first experimenter left the room. The posttester gave an appearance of not knowing exactly what he should do to make the most of his 15 minutes. Finally, however, he collected his thoughts and told the subjects the following:

> I've got about half a dozen tasks here and I've been giving approximately three or four of them, randomly, to each of the subjects I've been running, depending of course on the amount of time available. Let me check now [looking into his folder]. I think . . . with 15 minutes I'll give you some semantic differential material, an opinion questionnaire, and finally an aesthetic preference test.[6]

[6] Questions were embedded in the "opinion questionnaire" and the "aesthetic preference test" in order to test for generalization effects. One question on the opinion questionnaire asked the subject to advise "Mr. N., the chief curator of a large art

The posttester then explained semantic differential scales to the subject, indicated that he was "doing a replication of some earlier work," and that he would have to look up "20 words randomly from lists used in previous studies and published in this book." The book, which the subjects saw, was *The Measurement of Meaning* (Osgood, Suci, & Tannenbaum, 1957). Fourteen adjectives and six adjective-noun phrases were inserted in the book. Subjects rated these stimuli on evaluative scales taken from the semantic differential (Osgood et al., 1957). Five scales were used: good-bad, beautiful-ugly, pleasant-unpleasant, sweet-sour, and painful-pleasurable. Three scales were labeled positive-negative while two scales were reversed. Evaluation of the signal words, "light" and "dark," constituted the main dependent variables of the study. As a test of generalization, subjects also evaluated the words "white" and "black" and the adjective-noun phrases "light car" and "dark car." Each of these stimuli received a score from 5 (most negative) through 20 (neutral) to 35 (most positive).

After the posttester had completed his third task, he thanked the subject and went to find the first experimenter. The first experimenter returned and completed a short fifth block of shock trials. He then asked the subject to fill out a questionnaire which the psychology department was supposedly using to evaluate some of its experiments. The experimenter explained that he was not allowed to see this anonymous "departmental questionnaire," and asked the subjects to place it in an envelope after completion. The real purpose of this questionnaire was to check for suspicion. Each subject was asked to describe "the purpose of each experiment in her own words." Finally subjects were debriefed.

RESULTS

Elimination of a Demand-Characteristic Explanation

The "departmental questionnaire" revealed that all subjects reported that they believed the contrived purpose of each experiment. Careful debriefing, during which the experimenter encouraged any questions or comments about either study, revealed that no subject reported that these two supposedly unrelated studies were associated. Taken at face validity, these verbal reports imply that any "demands," created by the conditioning procedure, could not influence behavior during the posttest. Thus the experimental design appears to have ruled out a demand-characteristic explanation of *any* potential result. It must be noted, however, that given modern technology, a demand explanation can never be entirely ruled out, unless no experimental effect is produced.

museum," who had to make an important decision between displaying the "light, colorful but somewhat shallow works of Artist X" and the "dark, strong but somewhat sedate works of Artist Y." On the aesthetic preference test, subjects were asked: "How well do you like *light colors*?" and "How well do you like *dark colors*?" No differences between the experimental conditions obtained on these questions and the results will not be reported.

Physiological Evidence of Conditioning

A consistent GSP response on the nonshock trials was taken as independent evidence for conditioning. A GSP response was defined as a deflection in the onset-offset interval which was greater than any deflection in the preceding 10 seconds. In almost all cases, either a clear change or no change in the GSP level obtained during this interval. Thirteen of the 47 subjects failed to respond during this interval on at least half of the trials. These subjects were considered not to have shown independent evidence of conditioning.

Conditioning of Positive and Negative Affect

The mean evaluation of each signal word and the mean preference of "light" over "dark" are presented in Table 1 for all subjects and for conditionable subjects. Since these data can be more easily viewed in terms of the preference of "light" over "dark," the results will mainly be discussed in terms of the mean preference (or difference) scores.[7]

[7] Because the word-variable is a within-subject variable, there are two equivalent ways to analyze the results. The word-variable may be considered a repeated measure. In this case, the appropriate analysis is that of a two-factor experiment with a repeated measure on one factor (Winer, 1962, p. 302). Equivalently, each subject may be used as her own control and a difference or preference score between the two words can be calculated. In this case, the equivalent analysis is that of a single-factor experiment (Winer, 1962, p. 46).

To test the overall hypothesis that a stimulus will come to be evaluated positively if it is paired with the offset of pain and anxiety and negatively if it is paired with the onset of an aversive stimulus, a 1 *df*, a priori contrast was formed. In the repeated-measure analysis this contrast is orthogonal to both main effects and attempts to account for the systematic variance produced by the overall Word × Group interaction. In the single-factor analysis, the equivalent contrast is the linear trend comparison (Winer, 1962, p. 97). It should be noted that the Word × Group interaction is equivalent to the overall between-condition effect for the preference means.

TABLE 1

MEAN EVALUATION OF THE SIGNAL WORDS, "LIGHT" AND "DARK," AND THE MEAN PREFERENCE OF "LIGHT" OVER "DARK" (LIGHT MINUS DARK) FOR ALL SUBJECTS AND FOR CONDITIONABLE SUBJECTS

Condition (or group)	Word		
	Light	Dark	Light minus dark
Light-on/dark-off, $n = 18$ (13)[a]	25.33 (25.08)[b]	24.00 (25.15)	1.33 (−.08)
Control, $n = 9$ (9)	26.22 (26.22)	22.00 (22.00)	4.22 (4.22)
Light-off/dark-on, $n = 20$ (14)	27.00 (27.21)	22.10 (19.57)	4.90 (7.64)

Note.—The higher the mean, the more favorable the evaluation. The neutral point on the scale is 20.
[a] n's for conditionable subjects are in parentheses.
[b] Means for conditionable subjects are in parentheses.

It must be noted first, however, that a significant word effect obtained. In the present population of subjects the word light was evaluated more positively than the word dark (for all subjects, $F = 9.75$, $df = 1/44$, $p < .01$; for conditionable subjects, $F = 10.25$, $df = 1/33$, $p < .01$). Thus, compared to the control condition, the prediction is that the mean preference of light over dark will be larger when light is the offset signal (and dark is the onset signal) and smaller when light is the onset signal (and dark is the offset signal).

The pattern of mean preferences, presented in Table 1, conforms to this expectation. The mean preference of light over dark is largest in the light-off/dark-on condition, intermediate in the control condition, and smallest in the light-on/dark-off condition for all subjects and for conditionable subjects. Although, for all subjects, the a priori linear trend component accounts for 94.3% of the between-condition variation, this trend does not reach a conventional level of significance ($F = 2.16$, $df = 1/44$, $p < .20$).

However, when only those subjects who gave independent physiological evidence of conditioning (conditionable subjects) are considered, the results are much strengthened. For conditionable subjects, the predicted linear trend was significant ($F = 7.14$, $df = 1/33$, $p < .05$) and accounted for 99.6% of the systematic variation between the three experimental conditions. Thus both hypotheses are supported for those subjects who gave independent physiological evidence of conditioning—both positive and negative affect appear to have been conditioned.

Considering the signal words separately, it can be seen that the onset and offset conditioning effects occurred primarily with the word dark. For conditionable subjects, the a priori test for linear trend on dark is highly significant ($F = 9.18$, $df = 1/33$, $p < .01$) accounting for 99.9% of the systematic between-condition variation. Although the pattern of means conforms to expectation with the word light, the linear trend is not significant ($F = 1.25$, $df = 1/33$). The initial difference in affect associated with the two words is a probable reason for their differential susceptibility to conditioning. In the control condition, the mean evaluations of light and dark deviate from neutrality in the positive direction (6.22 and 2.00 units, respectively). The differential deviation from the neutral point of 4.22 units is significant at the 10% level ($t = 1.85$, $df = 8$). It seems reasonable to suggest that the greater the amount of affect initially associated with a CS, the more difficult it will be to condition affect to this CS.

Generalization of Conditioned Affect

The mean evaluation of "white" and "black" and the mean preference of "white" over "black" are presented in Table 2 for all subjects and for conditionable subjects. Again, it must be noted first that a significant word

TABLE 2

MEAN EVALUATION OF THE RELATED WORDS, "WHITE" AND "BLACK," AND THE MEAN PREFERENCE OF "WHITE" OVER "BLACK" (WHITE MINUS BLACK) FOR ALL SUBJECTS, AND FOR CONDITIONABLE SUBJECTS

Condition (or group)	Word		
	White	Black	White minus black
Light-on/dark-off, $n = 18$ (13)[a]	23.50 (24.23)[b]	21.33 (21.77)	2.17 (2.46)
Control, $n = 9$ (9)	25.78 (25.78)	19.00 (19.00)	6.78 (6.78)
Light-off/dark-on, $n = 20$ (14)	24.70 (25.50)	18.35 (16.21)	6.35 (9.29)

Note.—The higher the mean, the more favorable the evaluation. The neutral point on the scale is 20.
[a] n's for conditionable subjects are in parentheses.
[b] Means for conditionable subjects are in parentheses.

effect obtained. In this case the word white was evaluated more positively than the word black (for all subjects, $F = 22.86$, $df = 1/44$, $p < .01$; for conditionable subjects, $F = 31.19$, $df = 1/33$, $p < .01$).

The pattern of mean preferences, presented in Table 2, conforms closely to the main dependent measure when all subjects are considered and exactly when only conditionable subjects are considered. For all subjects, the results are again of marginal significance. Significant at the 10% level ($F = 3.45$, $df = 1/44$), the linear trend accounts for only 79.6% of the between-condition variation. Just as was the case for the signal words, however, the results are much strengthened when only the conditionable subjects are considered. Now the predicted trend is significant at the 5% level ($F = 7.10$, $df = 1/33$) and accounts for 98.9% of the between-condition variation. Thus both positive and negative affect appear to have generalized to the related words, white and black.

Predictably, generalization occurred to a greater extent from the word that was most susceptible to conditioning. Thus the linear trend for black is significant ($F = 7.10$, $df = 1/33$, $p < .05$) and accounts for 99.6% of the between-condition variation. The linear trend is not significant for white ($F < 1$). In the control condition, white, just as light, deviated significantly more from neutrality than its opposite (mean differential deviation of 4.78 units; $t = 2.49$, $df = 8$, $p < .05$).

The adjective-noun phrases, "light car" and "dark car," did not show a generalization effect, even when only conditionable subjects are considered.

DISCUSSION

By pairing meaningful adjectives with the onset and offset of electric shock, two attitudes, one based on negative affect and one based on positive affect, were created within each subject. It was hypothesized that classical conditioning would establish these attitudes. However, the possibility that these attitudes were established by relational learning (or the ability to verbalize the contingencies) cannot be ruled out.

In any case, the present experiment attempted to rule out a demand-characteristic explanation of *any* possible result by divorcing the conditioning procedure from the posttest. Subjects did report that they believed the stated purpose of each experiment and that they did not feel the two studies were related.

Three aspects of the data are also inconsistent with a simple demand-characteristic explanation. First, the conditioning effect was stronger for subjects with independent physiological evidence of conditioning. Second, the conditioning effect was stronger for the more neutral or less extreme signal word (i.e., dark). Third, conditioned affect generalized from the specific signal words to a related concept (i.e., white and black), but not to various adjective-noun phrases (e.g., light car and dark car).

While these last three results suggest that a demand-characteristic explanation is unable to account for the overall results, they also contribute to the fact that the overall results appeared to be weaker than the results of other conditioning studies.

The fact that the overall results were not strong, however, leads to the troublesome problem that not all subjects conditioned. Two problems may be responsible for this fact. The first problem is that only 25 conditioning trials were employed. Clearly, more trials should increase the power of the conditioning technique. However, despite 30–60-second rest periods between trials and 2-minute rest periods between blocks of trials, subjects already appeared to be adapting to the shock by the end of the session. A solution to this problem would be to run each subject over several days (as is the practice in animal research). The second problem is that meaningful social stimuli already may have strong evaluative connotations. This problem has already been discussed.

Finally, it must be noted that Wolpe and Lazarus' (1966, p. 149) suggestion that positive affect is associated with the offset of shock seems to have received some empirical support. It must be stressed, however, that the present study did not specifically test the difference between the cessation of pain and the cessation of danger. The data do suggest, however, that if subjects were not aroused (i.e., did not show physiological evidence of

conditioning) the conditioning effect was extremely weak. This fact may imply that the important theoretical contingency for the conditioning of positive affect was a pairing which occurred with anxiety-reduction (or relief). Anxiety-reduction may be associated with the cessation of pain (cf. Wolpe & Lazarus, 1966), with the cessation of danger (cf. Rescorla & LoLordo, 1965), or with both. Since the present experiment did not distinguish these possibilities, it would seem interesting to test the difference between the cessation of a painful stimulus and the cessation of a danger period in a future experiment.

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(Received April 10, 1969)