Magnitude of retaliation as a function of the similarity of available responses to those employed by attacker

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Under the guise of a stress and problem-solving experiment, 56 Ss in a 2 by 2 by 2 factorial design were given (1) either electric shocks or a negative point rating at (2) one of two levels—2 (control) or 6 (attack)—and (3) allowed to retaliate with electric shock or a negative point rating. As predicted, retaliation was greater under the attack condition. Also as predicted, Ss in the attack condition who were allowed to respond in the same manner by which they were attacked retaliated more than Ss responding in the different mode. Results were interpreted in terms of their implications for the frustration-aggression hypothesis.

In recent years Berkowitz and his associates have conducted a number of studies of behavior following interpersonal attack. In some of these studies (Berkowitz, Green, & Macaulay, 1962; Berkowitz & Geen, 1966; Berkowitz & LePage, 1967), it has been found that Ss who receive a large number of shocks (attack or angered condition) from an experimental confederate subsequently deliver more shocks to the confederate than do Ss who received fewer shocks from the confederate (no attack condition). Berkowitz (1969), viewing the attack as frustration, interpreted these findings as further evidence that frustration increases the probability of aggressive responses. In some of these studies it was also found that Ss who had been presented with aggressive "cues" (e.g., a bloody prize fight film or weapons) delivered more shocks to the confederate than did other Ss. However, attacked Ss delivered significantly more shocks to the confederate than Ss not attacked, whether or not they had been provided with aggressive "cues." Moreover, in another study in which aggressive cues were not presented to the Ss, Geen, Rakosky, & O'Neal (1968) reported that attacked Ss gave more shocks to the confederate than did Ss not attacked.

Despite the fact that it has been adequately demonstrated in the literature that both frustration and cues affect aggressive responses, the particular experimental paradigm described above—measuring aggression following an interpersonal attack—allows for at least one additional factor to contribute to the magnitude of the response. To be sure, the response made by the Ss in such a

situation may be labeled aggression; however, it might more specifically be conceptualized as an act of retaliation in response to the previous attack.

If retaliation is a factor contributing to the magnitude of the response to attack-induced frustration, then it would seem that this response would be greater where the S had a clear-cut opportunity to respond in a manner similar to that employed by his attacker. In order to test such a notion, an experimental design would be required in which the Ss were allowed to attack their tormenter either in the way he had previously attacked them or in a different way. If both of these modes are clear-cut examples of delivery of noxious stimuli to another person and so qualify as aggression (Buss, 1961), and if the magnitude of response following attack is greater when the mode of response is similar to the mode of the original attack, then this difference in response magnitude could plausibly be attributed to retaliation.

In the present experiment, the situation was similar to that employed in previous studies of aggression. That is, it was represented to the S as a study of the effect of stress on problem solving. The S was first exposed to an attack by an experimental confederate and then given an opportunity to attack the confederate. Two modes of attack were used in a factorial design for the confederate's attack and the S's responses, so that half the Ss used a mode of response similar to that used to attack them and half used a different mode.

DESIGN AND OVERVIEW

Under the guise of a "stress and problem-solving" experiment, Ss received either a favorable or an unfavorable evaluation of the solution to their problem from an experimental confederate (C) posing as another S.

This evaluation was communicated in the form of a number of electric shocks or via a digital counter. Following this, the Ss were allowed to evaluate the confederate's solution and to communicate this to the confederate either through shocks or by the counter.

The experimental design was a 2 by 2 by 2 factorial of attack (six shocks or a rating of 6) or no attack (two shocks or a rating of 2) by confederate's mode of evaluation (shock or visual) by the S's mode of evaluation (shock or visual). Two different problems were used in the experiment, one for the S and one for the confederate. The solution to the confederate's problem was standard and used for all Ss.

SUBJECTS

The Ss were 56 male undergraduates at Tulane University who participated to earn extra points toward their final grade in introductory psychology.

APPARATUS

The Ss were seated at adjacent tables separated by an opaque partition. On each table was a small aluminum box, on which was affixed a counter and a toggle switch. Wires connected the two boxes to each other and to a variable shock generator. Also coming out of the boxes were wires that connected to plastic shock cuffs with brass electrodes that fastened to the arm of the S. When the switch on one of the boxes was depressed, it passed current to the box on the other table, advancing the counter by one and delivering a shock of 140 V ac at a maximum of 0.1 mA.

PROCEDURE

At the laboratory, the S was met by the E and the C, who was posing as another S. Both were told that the experiment involved electric shock and that they could decline to participate if they chose to do so. None of the Ss refused to participate. They were then taken to the experimental room where a standard set of instructions was presented. The E explained that this was to be a study of problem-solving ability under different kinds of stress: an evaluation by the other person by means of electric shock or a negative point rating. Each person was seated at a table and given instructions on how to communicate evaluations with the apparatus: By depressing the lever on the box a number of times it was possible to communicate to the other person the evaluation of his solution to his problem. Half of the Ss were told that by virtue of their "subject number," they would receive their evaluation in electric shock. The other half were told that they would receive it via the digital counter. Also, half of the Ss were told that they would be evaluating the other person with

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Fig. 1. Mean evaluative responses.

electric shock, and half were told that they would evaluate via the counter.

The evaluations of the solutions were to be as follows: One shock or a counter rating of 1 would signify that the solution was very good; seven shocks or a counter rating of 7 would signify that the solution was very poor. Numbers in between would stand for various levels of performance between very good and very poor. At this point the shock cuffs were attached to whomever was to receive shock, and both were given a copy of a problem to solve and 5 min in which to write their answers. Unbeknownst to S, the C removed his shock cuff during this time and prepared to record the responses that the S was to make. At the end of the 5 min, E took up the solutions and exchanged them; the S was actually given a standard solution that was used for all Ss as the one written by C. After an additional minute to allow both persons to look over the other's solution, the confederate was instructed to make his evaluation of the S's solution. C either gave the S two or six shocks or a rating of 2 or 6, depending on the condition. Following C's evaluation, S was given the opportunity to evaluate C by shock or the counter. The E then gave each person a mood questionnaire which was ostensibly for the information of the psychology department. The Ss were thanked for their participation in the study and dismissed.

RESULTS AND DISCUSSION

First of all, it is relevant to point out that whatever the mode of evaluation employed by the confederate and by the S, those Ss receiving the negative evaluation

(attack conditions) returned a significantly more negative evaluation to the confederate than did those who had received a positive evaluation (control conditions) ($F = 23.68$, $df = 1, 48$, $p < .001$). This finding does not conflict with those reported in the Berkowitz studies and gives further emphasis to the conclusions drawn by Geen (1968) regarding the efficacy of attack (as opposed to task frustration) in producing aggression effects.

However, contrary to what might have been expected from previous aggression studies, neither the mode of attack employed by the confederate nor the mode of attack available to the S produced main effects on negativity of the Ss' evaluation of the confederate. Delivery of an intrinsically noxious stimulus to a S has been found to reliably produce aggressive behavior in a wide range of animal species (e.g., Ulrich & Azrin, 1962) and in humans (e.g., Berkowitz, 1964). Insult has been another frequently employed manipulation of frustration (e.g., Berkowitz & Geen, 1962; Cowen, Landes, & Schaet, 1959). Since the counter was present for all conditions, the Ss receiving shocks also received a numerical evaluation via the counter. The combination of these two "frustration" manipulations—injury added to insult—might be expected to produce greater effects upon aggression than negative evaluation alone. However, the present data do not fulfill this expectation and would seem to support a retaliation interpretation.

A related issue is the matter of the failure to obtain main effects for the mode of attack available to the S. If the Ss' negative evaluation of the confederate is to be understood as aggression, then it might be expected that the Ss would be more inhibited against "aggressing" when they are led to believe their attack on the confederates will cause him physical pain. If such inhibition was produced in those Ss for whom the shock mode of attack was available, the data do not reflect it. Individuals for whom the shock mode of attack was available gave no more positive evaluation of the confederate than did the Ss who had access to the visual mode.

The main prediction in the present study involved the interaction between S mode and confederate mode of attack, and for the attack condition this prediction was confirmed ($F = 4.74$, $df = 1, 24$, $p < .05$). Figure 1 shows the mean responses, and it can be seen that the attacked Ss were more negative in their evaluation of the confederate if the mode of evaluation available to them was the

same as that employed by their attacker. Thus the prediction was confirmed that when attacked and offered an opportunity to retaliate in kind, Ss are more aggressive than when this opportunity is less obvious.

On the basis of retaliation, we would expect little differences among the conditions in the control group; since they had not been attacked, they had no reason to retaliate, and the different response modes should not have affected their behavior. Contrary to this line of reasoning, however, there was a significant S-Mode by Confederate-Mode interaction for the control condition ($F = 7.32$, $df = 1, 24$, $p < .05$). From inspection of the data (Fig. 1) it appears that *this* interaction was due chiefly to differences between Ss returning a visual evaluation. It can be seen in the figure that the Ss receiving two shocks and responding in the visual mode gave the confederate the more favorable evaluation. One possible explanation for these results is that for these Ss it might have appeared that the confederate's evaluation of them represented an attempt to minimize the pain accompanying the evaluation. It would seem to follow that leniency in subsequent evaluation of the confederate would be expected. The Ss in the same condition who had received a visual evaluation may have interpreted the confederate's evaluation of them not so much as a gratuitous act of leniency as an accurate evaluation of their solution. For these Ss, therefore, the evaluation of the confederate's solution was to be approached with the same "objectivity." This objectivity could have produced the rating of 3—neither very good nor very bad—because, by design, the confederate's standard solution to the problem was intended to be in the midrange of a continuum from good to bad in order to avoid the possibility of ceiling effects.

In conclusion, these results suggest that one determinant of the intensity of "aggression" revealed by Ss who attack their attacker is the availability of the mode of attack previously employed against them. In view of such results, "attack and retaliation" would seem to be as descriptive of the behavioral sequence as the more frequently employed label, "frustration and aggression."

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The formation of organizational units in free recall learning*

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Free recall and subjective organization performance were studied as a function of various orders of presentation. Performance was enhanced by the consistent simultaneous or consistent sequential presentation of the members of preestablished high organizational units and by consistent simultaneous presentation of arbitrarily selected low organizational units. Simultaneous but inconsistent presentation of low organizational units impoverished performance.

Tulving (1968) has recently emphasized the importance of describing intraexperimental conditions which influence the formation of subjective organization units in free recall learning. The present study focuses upon whether or not blocked presentation can facilitate recall and subjective organization of unrelated words. Blocking was studied both by comparing simultaneous and sequential presentation of preestablished highly organized pairs, and, within sequential presentation, the number of items interpolated between pair members was systematically varied. In addition, arbitrarily selected low organized pairs were presented either simultaneously or sequentially and either consistently or inconsistently on each trial.

PROCEDURE AND MATERIALS

A list was composed of 16 words minimally interassociated in terms of free association norms. Of the 240 possible interitem associations, there was only 1 (2.7%). The 16 words comprised eight pairs of words known to be relatively highly subjectively organized by performing an item analysis of subjective organization

units for the data of a previous study. The percentage of the time the eight subjective organization units occurred in the earlier experiment ranged from 6.8% to 34.7%, with a mean value of 15.3%. The percentages were calculated by dividing the number of occurrences of each organizational pair by the number of times each pair could have been recalled. The word pairs, followed by their percentages of occurrences, were: holes, hold (34.7%); eagle, earth (22.2%); street, metropolis (14.9%); table, glass (14.9%); loud, dream (10.9%); cheese, plain (10.1%); things, tool (7.7%); health, sorrow (6.8%). The Kućera-Francis (1967) word frequencies of the words ranged from 5 to 244 occurrences per million words.

The same 16 words were employed for eight experimental conditions based on the order of presentation of the words as follows: For Group 1 the members of each highly organized pair were always presented simultaneously, but the order of the pairs (blocks) was randomized on each trial. Presentation for Group 2 was the same as for Group 1, but instead of the pairs being presented simultaneously, the words were presented sequentially, one by one, as in typical presentations of free recall lists. Presentation for Group 3 was also sequential and similar to

Group 2, except that the pair members were always separated by three randomly intervening words. Presentation for Group 4 was the same as for Group 3, except that the pair members were now separated by seven randomly intervening words. For Group 5, the 16 words were randomized in a different order on each trial, and presentation of the words was sequential. This presentation paradigm is the typical one for free recall experiments and may therefore be considered as a baseline for comparisons. Presentation for Group 6 was the same as for Group 5, but the 1st and 2nd words, 3rd and 4th words . . . 15th and 16th words on each trial were simultaneously presented. For Group 7, eight pairs of low organized words were arbitrarily selected to be consistently and simultaneously presented, but the order of the pairs (blocks) was randomized on each trial. Presentation for Group 8 was the same as for Group 7, except that the arbitrarily selected pair members were presented sequentially. Thus, Groups 1-4 were presented with the highly organized pairs either simultaneously or sequentially and with zero, three, or seven intervening words between the members of the highly organized pairs. In Groups 5-8, nonhighly organized pairs were presented either simultaneously or sequentially, and these pairs were either consistent or different from trial to trial. For all groups the within-pair serial order of each of the eight preestablished high organization units was always maintained. In the randomizations for Groups 5-8, preestablished pair members were never allowed to appear contiguously; this restriction is necessarily true for Groups 3 and 4. The mean distance between the high organizational pair members was 4.8 words for Groups 5 and 6 and 4.6 words for Groups 7 and 8.

For simultaneous presentation, the two members of each pair were located one above the other on a single slide exposed for 2 sec per slide. For sequential presentation each word appeared on a separate slide exposed for 1 sec per slide. The words were randomized on each trial in accordance with the procedures outlined above, and, in addition, repetitions of serial order positions and primacy and recency positions for the words were minimized. Twelve alternating presentation and 60-sec written recall periods were given. Standard free recall instructions were given which emphasized that only the number of words recalled was important and not the order of their recall. The instructions were identical for all groups, and no information was

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