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WEAPONS AS AGGRESSION-ELICITING STIMULI¹

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An experiment was conducted to test the hypothesis that stimuli commonly associated with aggression can elicit aggressive responses from people ready to act aggressively. 100 male university students received either 1 or 7 shocks, supposedly from a peer, and were then given an opportunity to shock this person. In some cases a rifle and revolver were on the table near the shock key. These weapons were said to belong, or not to belong, to the available target person. In other instances there was nothing on the table near the shock key, while for a control group 2 badminton racquets were on the table near the key. The greatest number of shocks was given by the strongly aroused Ss (who had received 7 shocks) when they were in the presence of the weapons. The guns had evidently elicited strong aggressive responses from the aroused men.

Human behavior is often goal directed, guided by strategies and influenced by ego defenses and strivings for cognitive consistency. There clearly are situations, however, in which these purposive considerations are relatively unimportant regulators of action. Habitual behavior patterns become dominant on these occasions, and the person responds relatively automatically to the stimuli impinging upon him. Any really complete psychological system must deal with these stimulus-

elicited, impulsive reactions as well as with more complex behavior patterns. More than this, we should also be able to specify the conditions under which the various behavior determinants increase or decrease in importance.

The senior author has long contended that many aggressive actions are controlled by the stimulus properties of the available targets rather than by anticipations of ends that might be served (Berkowitz, 1962, 1964, 1965). Perhaps because strong emotion results in an increased utilization of only the central cues in the immediate situation (Easterbrook, 1959; Walters & Parke, 1964), anger arousal can lead to impulsive aggressive responses which, for a short time at least, may be relatively free of cognitively mediated inhi-

¹The present experiment was conducted by Anthony LePage under Leonard Berkowitz' supervision as part of a research program sponsored by Grant G-23988 from the National Science Foundation to the senior author.

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bitions against aggression or, for that matter, purposes and strategic considerations.³ This impulsive action is not necessarily pushed out by the anger, however. Berkowitz has suggested that appropriate cues must be present in the situation if aggressive responses are actually to occur. While there is still considerable uncertainty as to just what characteristics define aggressive cue properties, the association of a stimulus with aggression evidently can enhance the aggressive cue value of this stimulus. But whatever its exact genesis, the cue (which may be either in the external environment or represented internally) presumably elicits the aggressive response. Anger (or any other conjectured aggressive "drive") increases the person's reactivity to the cue, possibly energizes the response, and may lower the likelihood of competing reactions, but is not necessary for the production of aggressive behavior.⁴

A variety of observations can be cited in support of this reasoning (cf. Berkowitz, 1965). Thus, the senior author has proposed that some of the effects of observed violence can readily be understood in terms of stimulus-elicited aggression. According to several Wisconsin experiments, observed aggression is particularly likely to produce strong attacks against anger instigators who are associated with the victim of the witnessed violence (Berkowitz & Geen, 1966, 1967; Geen & Berkowitz, 1966). The frustrator's association with the observed victim presumably enhances his cue value for aggression, causing him to evoke stronger attacks from the person who is ready to act aggressively.

More direct evidence for the present formulation can be found in a study conducted by Loew (1965). His subjects, in being required to learn a concept, either aggressive or nature words, spoke either 20 aggressive or 20 neutral words aloud. Following this "learning task," each subject was to give a peer in an adjacent room an electric shock whenever this person made a mistake in his learning problem. Allowed to vary the intensity of the shocks they administered over a 10-point continuum, the subjects who had uttered the aggressive words gave shocks of significantly

greater intensity than did the subjects who had spoken the neutral words. The aggressive words had evidently evoked implicit aggressive responses from the subjects, even though they had not been angered beforehand, which then led to the stronger attacks upon the target person in the next room when he supposedly made errors.

Cultural learning shared by many members of a society can also associate external objects with aggression and thus affect the objects' aggressive cue value. Weapons are a prime example. For many men (and probably women as well) in our society, these objects are closely associated with aggression. Assuming that the weapons do not produce inhibitions that are stronger than the evoked aggressive reactions (as would be the case, e.g., if the weapons were labeled as morally "bad"), the presence of the aggressive objects should generally lead to more intense attacks upon an available target than would occur in the presence of a neutral object.

The present experiment was designed to test this latter hypothesis. At one level, of course, the findings contribute to the current debate as to the desirability of restricting sales of firearms. Many arguments have been raised for such a restriction. Thus, according to recent statistics, Texas communities having virtually no prohibitions against firearms have a much higher homicide rate than other American cities possessing stringent firearm regulations, and J. Edgar Hoover has maintained in *Time* magazine that the availability of firearms is an important factor in murders (Anonymous, 1966). The experiment reported here seeks to determine how this influence may come about. The availability of weapons obviously makes it easier for a person who wants to commit murder to do so. But, in addition, we ask whether weapons can serve as aggression-eliciting stimuli, causing an angered individual to display stronger violence than he would have shown in the absence of such weapons. Social significance aside, and at a more general theoretical level, this research also attempts to demonstrate that situational stimuli can exert "automatic" control over socially relevant human actions.

METHOD

Subjects

The subjects were 100 male undergraduates enrolled in the introductory psychology course at the University of Wisconsin who volunteered for the experiment (without knowing its nature) in order to earn points counting toward their final grade. Thirty-nine other subjects had also been run, but were discarded because they suspected the experi-

³ Cognitive processes can play a part even in impulsive behavior, most notably by influencing the stimulus qualities (or meaning) of the objects in the situation. As only one illustration, in several experiments by the senior author (cf. Berkowitz, 1965) the name applied to the available target person affected the magnitude of the attacks directed against this individual by angered subjects.

⁴ Buss (1961) has advanced a somewhat similar conception of the functioning of anger.

menter's confederate (21), reported receiving fewer electric shocks than was actually given them (7), had not attended to information given them about the procedure (9), or were run while there was equipment malfunctioning (2).

Procedure

General design. Seven experimental conditions were established, six organized in a 2×3 factorial design, with the seventh group serving essentially as a control. Of the men in the factorial design, half were made to be angry with the confederate, while the other subjects received a friendlier treatment from him. All of the subjects were then given an opportunity to administer electric shocks to the confederate, but for two-thirds of the men there were weapons lying on the table near the shock apparatus. Half of these people were informed the weapons belonged to the confederate in order to test the hypothesis that aggressive stimuli which also were associated with the anger instigator would evoke the strongest aggressive reaction from the subjects. The other people seeing the weapons were told the weapons had been left there by a previous experimenter. There was nothing on the table except the shock key when the last third of the subjects in both the angered and nonangered conditions gave the shocks. Finally, the seventh group consisted of angered men who gave shocks with two badminton racquets and shuttlecocks lying near the shock key. This condition sought to determine whether the presence of *any* object near the shock apparatus would reduce inhibitions against aggression, even if the object were not connected with aggressive behavior.

Experimental manipulations. When each subject arrived in the laboratory, he was informed that two men were required for the experiment and that they would have to wait for the second subject to appear. After a 5-minute wait, the experimenter, acting annoyed, indicated that they had to begin because of his other commitments. He said he would have to look around outside to see if he could find another person who might serve as a substitute for the missing subject. In a few minutes the experimenter returned with the confederate. Depending upon the condition, this person was introduced as either a psychology student who had been about to sign up for another experiment or as a student who had been running another study.

The subject and confederate were told the experiment was a study of physiological reactions to stress. The stress would be created by mild electric shocks, and the subjects could withdraw, the experimenter said, if they objected to these shocks. (No subjects left.) Each person would have to solve a problem knowing that his performance would be evaluated by his partner. The "evaluations" would be in the form of electric shocks, with one shock signifying a very good rating and 10 shocks meaning the performance was judged as very bad. The men were then told what their problems

were. The subject's task was to list ideas a publicity agent might employ in order to better a popular singer's record sales and public image. The other person (the confederate) had to think of things a used-car dealer might do in order to increase sales. The two were given 5 minutes to write their answers, and the papers were then collected by the experimenter who supposedly would exchange them.

Following this, the two were placed in separate rooms, supposedly so that they would not influence each other's galvanic skin response (GSR) reactions. The shock electrodes were placed on the subject's right forearm, and GSR electrodes were attached to fingers on his left hand, with wires trailing from the electrodes to the next room. The subject was told he would be the first to receive electric shocks as the evaluation of his problem solution. The experimenter left the subject's room saying he was going to turn on the GSR apparatus, went to the room containing the shock machine and the waiting confederate, and only then looked at the schedule indicating whether the subject was to be angered or not. He informed the confederate how many shocks the subject was to receive, and 30 seconds later the subject was given seven shocks (angered condition) or one shock (nonangered group). The experimenter then went back to the subject, while the confederate quickly arranged the table holding the shock key in the manner appropriate for the subject's condition. Upon entering the subject's room, the experimenter asked him how many shocks he had received and provided the subject with a brief questionnaire on which he was to rate his mood. As soon as this was completed, the subject was taken to the room holding the shock machine. Here the experimenter told the subject it was his turn to evaluate his partner's work. For one group in both the angered and nonangered conditions the shock key was alone on the table (no-object groups). For two other groups in each of these angered and nonangered conditions, however, a 12-gauge shotgun and a .38-caliber revolver were lying on the table near the key (aggressive-weapon conditions). One group in both the angered and nonangered conditions was informed the weapons belonged to the subject's partner. The subjects given this treatment had been told earlier that their partner was a student who had been conducting an experiment.⁵ They now were reminded of this, and the experimenter said the weapons were being used in some way by this person in his research (associated-weapons condition); the guns were to be disregarded. The other men were told simply the wea-

⁵ This information evidently was the major source of suspicion; some of the subjects doubted that a student running an experiment would be used as a subject in another study, even if he were only an undergraduate. This information was provided only in the associated-weapons conditions, in order to connect the guns with the partner, and, consequently, this ground for suspicion was not present in the unassociated-weapons groups.

pons "belong to someone else" who "must have been doing an experiment in here" (unassociated-weapons group), and they too were asked to disregard the guns. For the last treatment, one group of angered men found two badminton racquets and shuttlecocks lying on the table near the shock key, and these people were also told the equipment belonged to someone else (badminton-racquets group).

Immediately after this information was provided, the experimenter showed the subject what was supposedly his partner's answer to his assigned problem. The subject was reminded that he was to give the partner shocks as his evaluation and was informed that this was the last time shocks would be administered in the study. A second copy of the mood questionnaire was then completed by the subject after he had delivered the shocks. Following this, the subject was asked a number of oral questions about the experiment, including what, if any, suspicions he had. (No doubts were voiced about the presence of the weapons.) At the conclusion of this interview the experiment was explained, and the subject was asked not to talk about the study.

Dependent Variables

As in nearly all the experiments conducted in the senior author's program, the number of shocks given by the subjects serves as the primary aggression measure. However, we also report here findings obtained with the total duration of each subject's shocks, recorded in thousandths of a minute. Attention is also given to each subject's rating of his mood, first immediately after receiving the partner's evaluation, and again immediately after administering shocks to the partner. These ratings were made on a series of 10 13-point bipolar scales with an adjective at each end, such as "calm-tense" and "angry-not angry."

RESULTS

Effectiveness of Arousal Treatment

Analyses of variance of the responses to each of the mood scales following the receipt of the partner's evaluation indicate the prior-shock treatment succeeded in creating differences in anger arousal. The subjects getting seven shocks rated themselves as being significantly angrier

TABLE 1

ANALYSIS OF VARIANCE RESULTS FOR NUMBER OF SHOCKS GIVEN BY SUBJECTS IN FACTORIAL DESIGN

Source	df	MS	F
No. shocks received (A)	1	182.04	104.62*
Weapons association (B)	2	1.90	1.09
A × B	2	8.73	5.02*
Error	81	1.74	

* $p < .01$.

TABLE 2
MEAN NUMBER OF SHOCKS GIVEN
IN EACH CONDITION

Condition	Shocks received	
	1	7
Associated weapons	2.60 _a	6.07 _d
Unassociated weapons	2.20 _a	5.67 _{od}
No object	3.07 _a	4.67 _{bo}
Badminton racquets	—	4.60 _b

Note.—Cells having a common subscript are not significantly different at the .05 level by Duncan multiple-range test. There were 10 subjects in the seven-shocks-received-badminton-racquets group and 15 subjects in each of the other conditions.

than the subjects receiving only one shock ($F = 20.65$, $p < .01$). There were no reliable differences among the groups within any one arousal level. Interestingly enough, the only other mood scale to yield a significant effect was the scale "sad-happy." The aroused-seven-shocks men reported a significantly stronger felt sadness than the men getting one shock ($F = 4.63$, $p > .05$).

Aggression toward Partner

A preliminary analysis of variance of the shock data for the six groups in the 3×2 factorial design yielded the findings shown in Table 1. As is indicated by the significant interaction, the presence of the weapons significantly affected the number of shocks given by the subject when the subject had received seven shocks. A Duncan multiple-range test was then made of the differences among the seven conditions means, using the error variance from a seven-group one-way analysis of variance in the error term. The mean number of shocks administered in each experimental condition and the Duncan test results are given in Table 2. The hypothesis guiding the present study receives good support. The strongly provoked men delivered more frequent electrical attacks upon their tormentor in the presence of a weapon than when nonaggressive objects (the badminton racquets and shuttlecocks) were present or when only the shock key was on the table. The angered subjects gave the greatest number of shocks in the presence of the weapons associated with the anger instigator, as predicted, but this group was not reliably different from the angered-unassociated-weapons conditions. Both of these groups expressing aggression in the presence of weapons were significantly more aggressive than the angered-neutral-object condition, but only the associated-weapons con-

TABLE 3
MEAN TOTAL DURATION OF SHOCKS
GIVEN IN EACH CONDITION

Condition	Shocks received	
	1	7
Associated weapons	17.93 _c	46.93 _a
Unassociated weapons	17.33 _c	39.47 _{ab}
No object	24.47 _{bc}	34.80 _{ab}
Badminton racquets	—	34.90 _{ab}

Note.—The duration scores are in thousandths of a minute. Cells having a common subscript are not significantly different at the .05 level by Duncan multiple-range test. There were 10 subjects in the seven-shocks-received-badminton-racquet group and 15 subjects in each of the other conditions.

dition differed significantly from the angered-no-object group.

Some support for the present reasoning is also provided by the shock-duration data summarized in Table 3. (We might note here, before beginning, that the results with duration scores—and this has been a consistent finding in the present research program—are less clear-cut than the findings with number of shocks given.) The results indicate that the presence of weapons resulted in a decreased number of attacks upon the partner, although not significantly so, when the subjects had received only one shock beforehand. The condition differences are in the opposite direction, however, for the men given the stronger provocation. Consequently, even though there are no reliable differences among the groups in this angered condition, the angered men administering shocks in the presence of weapons gave significantly longer shocks than the non-angered men also giving shocks with guns lying on the table. The angered-neutral-object and angered-no-object groups, on the other hand, did not differ from the nonangered-no-object condition.

Mood Changes

Analyses of covariance were conducted on each of the mood scales, with the mood ratings made immediately after the subjects received their partners' evaluation held constant in order to determine if there were condition differences in mood changes following the giving of shocks to the partner. Duncan range tests of the adjusted condition means yielded negative results, suggesting that the attacks on the partner did not produce any systematic condition differences. In the case of the felt anger ratings, there were very

high correlations between the ratings given before and after the shock administration, with the Pearson r s ranging from .89 in the angered-unassociated-weapons group to .99 in each of the three unangered conditions. The subjects could have felt constrained to repeat their initial responses.

DISCUSSION

Common sense, as well as a good deal of personality theorizing, both influenced to some extent by an egocentric view of human behavior as being caused almost exclusively by motives within the individual, generally neglect the type of weapons effect demonstrated in the present study. If a person holding a gun fires it, we are told either that he wanted to do so (consciously or unconsciously) or that he pulled the trigger "accidentally." The findings summarized here suggest yet another possibility: The presence of the weapon might have elicited an intense aggressive reaction from the person with the gun, assuming his inhibitions against aggression were relatively weak at the moment. Indeed, it is altogether conceivable that many hostile acts which supposedly stem from unconscious motivation really arise because of the operation of aggressive cues. Not realizing how these situational stimuli might elicit aggressive behavior, and not detecting the presence of these cues, the observer tends to locate the source of the action in some conjectured underlying, perhaps repressed, motive. Similarly, if he is a Skinnerian rather than a dynamically oriented clinician, he might also neglect the operation of aggression-eliciting stimuli by invoking the concept of operant behavior, and thus sidestep the issue altogether. The sources of the hostile action, for him, too, rest within the individual, with the behavior only steered or permitted by discriminative stimuli.

Alternative explanations must be ruled out, however, before the present thesis can be regarded as confirmed. One obvious possibility is that the subjects in the weapons condition reacted to the demand characteristics of the situation as they saw them and exhibited the kind of behavior they thought was required of them. ("These guns on the table mean I'm supposed to be aggressive, so I'll give many shocks.") Several considerations appear to negate this explanation. First, there are the subjects' own verbal reports. None of the subjects voiced any suspicions of the weapons and, furthermore, when they were queried generally denied that the weapons had any effect on them. But even those subjects who did express any doubts about the experiment typically acted like the other

subjects. Thus, the eight nonangered-weapons subjects who had been rejected gave only 2.50 shocks on the average, while the 18 angered-no-object or neutral-object men who had been discarded had a mean of 4.50 shocks. The 12 angered-weapons subjects who had been rejected, by contrast, delivered an average of 5.83 shocks to their partner. These latter people were evidently also influenced by the presence of weapons.

Setting all this aside, moreover, it is not altogether certain from the notion of demand characteristics that only the angered subjects would be inclined to act in conformity with the experimenter's supposed demands. The non-angered men in the weapons group did not display a heightened number of attacks on their partner. Would this have been predicted beforehand by researchers interested in demand characteristics? The last finding raises one final observation. Recent unpublished research by Allen and Bragg indicates that awareness of the experimenter's purpose does not necessarily result in an increased display of the behavior the experimenter supposedly desires. Dealing with one kind of socially disapproved action (conformity), Allen and Bragg demonstrated that high levels of experimentally induced awareness of the experimenter's interests generally produced a decreased level of the relevant behavior. Thus, if the subjects in our study had known the experimenter was interested in observing their *aggressive* behavior, they might well have given less, rather than more, shocks, since giving shocks is also socially disapproved. This type of phenomenon was also not observed in the weapons conditions.

Nevertheless, any one experiment cannot possibly definitely exclude all of the alternative explanations. Scientific hypotheses are only probability statements, and further research is

needed to heighten the likelihood that the present reasoning is correct.

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