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Vicarious aggression is said to reduce frustration by permitting the frustrated subject to identify with the aggressor. The hypothesis that vicarious aggressive experience will reduce frustration as expressed by physiological and psychological arousal, was investigated by assessing differences in arousal reduction achieved by direct counter-aggression or through aggressive responses expressed by a vicar (subject's ally). Counteraggression occurred through overt (physical and verbal) and covert (fantasy and no aggress) means. 128 undergraduate males were assigned to the different treatment conditions. Significant changes in systolic blood pressure were noted as a function of overt means of counteraggression. Effects of vicarious and direct means of counteraggression, however, did not differ significantly.

THE EFFECTS OF FOUR TYPES OF VICARIOUS AGGRESSION
ON PHYSIOLOGICAL AND PSYCHOLOGICAL AROUSAL¹

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Observations of a number of different patient samples in psychotherapy and other clinical contacts have revealed the general difficulty people experience in expressing aggression toward peers and other social contacts. What is even more striking is the discomfort felt by the individual which seems to accompany any aggressive action, or thought about aggressive activity. Theorists, researchers, therapists and others dealing with interpersonal behavior have paid considerable attention, albeit with differing terminology, to the general and complex phenomenon of aggressive activity.

When an aggressive response is contemplated and/or seen as appropriate, a general state of arousal is typically noted. The individual is aroused and perhaps frustrated by actions of others. But, he may have difficulty in communicating his experience to the instigator of the frustrating activity. A response of aggression, even when socially appropriate, seems to be inhibited by some anticipation of retaliation which may include loss of approval, physical injury, or other deleterious effects.

Another phenomenon which has been observed is that the aroused individual may experience relief when he sees the instigator of his frustration counteraggressed upon, particularly when the counteraggression is instigated by a close associate.

Theoretically, the Frustration-Aggression hypothesis presented by Dollard, Doob, Miller, Mowrer, and Sears (1939) and recently commented upon by Berkowitz (1958, 1962) serves as the foundation for this research. Rosenbaum and DeCharms (1960) moreover, in discussing the nature of vicarious aggression, noted that observation of the responses of others to environmental stimuli can effect the observer's response system in the same way as if he had carried out the behavior himself. Critical to this notion is the fact that regardless of who carries out the aggressive act, the S must perceive injury to the instigator and, in effect, feel some relief from this perceived injury (Thibault & Coules, 1952). In responding to a criticism of the frustration-aggression hypothesis that frustration need not always lead to aggression, Berkowitz (1962) suggests that aggression anxiety may be higher on the response hierarchy and therefore inhibit aggressive behavior. For this reason, vicarious behavior may carry less anxiety in that retaliation may well be expected toward the counteraggressing vicar as opposed to the S himself.

One is still left with the Rosenbaum and DeCharms (1960) notion that vicarious activity may affect the observer of that counteraggression as if he had carried out the aggression himself. Depending upon one's choice of words, the effect of seeing a frustrator aggressed upon can be a drive reducing one or an emotionally cathartic one. Regardless of the terms, there seems to be some type of tension reduction in perceiving the instigator injured. An effort to assess this "tension reduction" has been attempted by Hokanson and Sheller (1961) and by Hokanson and Burgess (1962) in which they measured physiological changes resulting

from Ss seeing instigators of frustration overtly injured. Their findings suggest that physiological tension reduction occurs only when the S sees the instigator injured physically or verbally. Tension appears to be sustained when counteraggression is carried out through fantasy.

The purpose of the present study was to combine many of the previously studied components of the frustration-aggression model into a single multidimensional approach. It was the intent of this study to assess physiological and psychological changes in arousal where Ss were permitted to counteraggress through one of four different modes by either direct or vicarious means of expression. A clear understanding of this experimental design required some precise terminology. Direct means of expressing aggression were those conditions in which the S or aroused individual communicated directly to the instigator of his frustration. Vicarious means of aggressing, on the other hand, were those same conditions communicated by the S's partner to be known as the vicar. Overt modes of aggressing, whether direct or vicarious, were considered to be physical and verbal response. Covert means of aggressing, whether direct or vicarious, were assessed in the form of fantasy or lack of response.

The following hypotheses were tested: (a) Changes in residual physiological arousal in Ss employing vicarious counteraggression will be similar to those Ss counteraggressing directly. That is, when the vicar expresses aggression overtly (physically and/or verbally) the S will show less residual physiological arousal, and, when the vicar expresses aggression covertly (fantasy and no responses) there will be

some elevation on physiological measures much like that seen in the direct paradigm. (b) There will be less residual psychological arousal for the S when the vicar communicates overtly than if the S does so himself. This should be true because of the anxiety created in direct communication as a result of fear or punishment or some combination of both. (c) There will be no differences on the psychological measures of arousal in the covert situations whether expression is vicarious or direct because of the less intrinsic danger of retaliation.

Method

Subjects

The Ss were 128 undergraduate males enrolled in introductory courses in the university. Sixty-four of these were considered controls. All Ss were exposed to high frustration. The experimental Ss were subsequently exposed to other differing experimental treatments.

Experimental Variables

The independent variables were (a) vicarious and direct means of counteraggression by the subject and, (b) overt (physical and verbal) versus covert (fantasy and no aggress) means of counteraggression under both vicarious and direct conditions of counteraggression.

The dependent variables were (a) residual psychological arousal as measured by Scheier and Cattell's IPAT & Parallel Form Anxiety Battery (Scheier & Cattell, 1960) and, (b) residual physiological arousal as measured by relative blood pressure, pulse rate and respiration rate recorded on a three channel polygraph.

Procedure

The experiment was introduced to the S as one involving physiological

and psychological responses to working on routine intellectual tasks. At this point, 32 of the experimental Ss and 32 of the controls were introduced to a vicar who was presented as a friend who would be available for help if needed.

Phase I. After a several minute adaptation period for both groups, the Ss (128) were administered the Picture Completion subtest of the WAIS (Hokanson et al., 1961, 1962) following which both physiological and psychological measures were taken.

Phase II. After another rest period the frustration manipulation phase was established. Here the 128 Ss were asked to count backwards from 99 to one as quickly as possible by two's. To make conditions highly frustrating, they were repeatedly interrupted and harassed concerning their slow performance, asked to begin again four times and finally stopped with the statement that their data could not be used. This technique has been used by Hokanson (1961) to indicate subjective feelings of intense anger.

Immediately following the frustration manipulation, the physiological and psychological measures were taken. Then half of the 64 experimental Ss were allowed to counteraggress by the four direct means to the instigator. The other 32 experimental Ss who had been going through the experiment with a vicar were permitted to vicariously counteraggress.

Phase III. The situation to permit both direct and vicarious counteraggression, was set up as follows: The Ss were told that the next task involved an interpersonal guessing game in that the S was to think of a number between one and ten and write it down, following which the S was

to guess the number. This was for ten trials. Under experimental condition #1 (direct aggression) eight Ss were assigned to each of four modes of counteraggressing. If the instigator guessed the number correctly the S merely nodded his approval; if the instigator guessed incorrectly, he was counteraggressed against depending upon the method called for. Now, under experimental condition #2 (vicarious) the S was told that if the instigator guessed incorrectly, the vicar would see the number written down and would communicate to the instigator under one of the four ways of aggressing. If the instigator guessed correctly, the vicar would nod approval. After the counteraggressing under experimental conditions #1 and #2, the Ss were again given the physiological and psychological measures.

The four modes of counteraggressing were:

1. Physical--Experimental condition #1--S applied apparent electric shock to the instigator.

Experimental condition #2--Vicar applied apparent electric shock to the instigator.

2. Verbal--Experimental condition #1--S permitted to verbally attack the instigator.

Experimental condition #2--Vicar permitted to verbally attack the instigator.

3. Fantasy--Experimental condition #1--S permitted to write a response to card 88M of TAT (Hokanson & Burgess, 1962).

Experimental condition #2--Vicar wrote attack on instigator and showed only to S.

4. No aggress--Experimental condition #1--S pressed button signalling wrong response.

Experimental condition #3--Vicar pressed button signalling wrong response.

The instigator in the experiment was introduced as a graduate student doing some research for his professor. The recorder was introduced as a lab technician and the vicar was introduced as a college classmate of the S. A graphic description of the S grouping is provided in Figure 1.

 Insert Figure 1 about here

Results

Effectiveness of the Arousal Technique

Assessment of the arousal technique (reversed counting) and the effectiveness of resting versus counteraggression after arousal was accomplished by separate analysis of variance for the three physiological and one psychological measure. Differences among treatment means were subsequently assessed by Duncan's New Multiple Range Test.

All 128 Ss were experiencing the same experimental conditions up to the termination of measurement after Phase II. Attention therefore had to be directed toward the effectiveness of the arousal task. Table 1 summarizes the mean changes from Phase I (baseline) to Phase II (post-arousal) for all four dependent variables.

 Insert Table 1 about here

Arousal is commonly perceived as an increase in physiological and/or

psychological activation. In this sense, evidence of a significant increase ($p < .01$) from baseline to postarousal could be demonstrated only for systolic blood pressure. There was a significant decrease ($p < .01$) in respiration as measured by breathing rate noted between Phase I and Phase II. No significant changes in pulse rate or anxiety were noted from Phase I to Phase II.

Changes After Resting or Counteraggression

The analysis of changes noted when Es were permitted to rest (controls) or to counteraggress (experimentals) is summarized in Tables 1 and 2.

Insert Table 2 about here

The analysis of the three phases of measurement generally yielded significant changes; however, not always in the direction expected. Changes for all physiological measures were significant ($p < .01$), but the psychological variable was not significantly affected. Blood pressure ($p < .01$) was significantly changed and in the predicted direction (Table 1). Es' blood pressure was significantly decreased after either resting or counteraggression and baseline measures (Phase I) did not differ significantly from postrelease (Phase III) measures (Table 1). Pulse rate ($p < .01$), although showing significant changes, was quite different in direction than blood pressure (Table 1). Pulse rate dropped upon each subsequent recording in such a manner that baseline and postarousal measures were not significantly different nor were postarousal and postrelease measures. However, postrelease was significantly different ($p < .01$) from baseline. Respiration showed significant changes ($p < .01$) with

each subsequent measurement and in much the same direction as the pulse rate. Respiration dropped significantly ($p < .01$) from the baseline measurement to both postarousal and postrelease. However, there was no significant drop from postarousal to postrelease just as was noted with pulse rate. Generally speaking, the arousal task and release mechanisms (rest or counteraggression) showed the expected directional results only for blood pressure with some significant, but confusing, effects for the pulse rate and respiration and absolutely no differential effect for the psychological variable.

Further Analysis of Ss Permitted to Counteraggress

A further analysis of the experimental Ss was performed in an effort to ascertain any differential effects of the mode of counteraggression. The initial analysis of these 64 Ss noted the combined effects of physical and verbal (overt) counteraggression as compared to that of fantasy and no aggress (covert). Subsequently, the four modes were assessed as to their individual effects. Within the experimental Ss, significant changes ($p < .01$) over times of measurement occurred for blood pressure and respiration. Also there was a significant interaction between occurrence of measurement and the mode of counteraggression. Table 3 shows the complete analysis of variance.

Insert Table 3 about here

Assessment of the changes effected by experimental conditions within the counteraggression group produced significant and expected results only for the blood pressure indicator ($p < .01$). Here, as in the overall

analysis, there was a significant difference between the postarousal measure and both baseline and postcounteraggression. Baseline and post-counteraggression were not significantly different. Although trends were similar with pulse rate and the psychological measure, changes here did not reach statistical significance. The respiration measure also varied significantly in the same direction as did the overall analysis (Table 4).

Insert Table 4 about here

Table 3 also indicates a significant ($p < .01$) interaction in the blood pressure variable between occurrence of measurement and the S's use of either overt or covert modes of counteraggression. Table 5 illustrates the treatment means for blood pressure as a function of overt and covert communication.

Insert Table 5 about here

In the experimental group, where counteraggression was permitted, both overt and covert means showed a significant increase in blood pressure from baseline to postarousal. However, in the overt condition where counteraggression was permitted by communicating either physically or verbally with the instigator, the postcounteraggression reading was significantly decreased ($p < .01$) whereas there was no significant decrease in the postcounteraggression of covert Ss where aggression was not overtly communicated to the instigator. Also, under overt conditions, the postcounteraggression reading was not significantly different from

baseline. Whereas the postcounteraggression covert reading was reduced, it was still significantly different from baseline ($p < .01$). The opportunity to express counteraggression overtly to the instigator had the expected results of lowering blood pressure to approximate baseline readings.

Table 3 summarizes the significant reading on respiration ($p < .01$) as related to occurrence of measure. Table 4 shows the treatment means for respiration to be decreasing in much the same way as in the overall analysis (Table 1). However, within the experimental group, the drop from baseline to postarousal to postcounteraggression failed to reach significance.

The noted interaction of overt and covert modes of counteraggression with occurrence of measure left open to question whether individual modes were contributing to the changing blood pressure readings after counteraggression. Further analysis of the individual modes revealed that both physical and verbal communication contributed equally to the reduced blood pressure under overt communication. The nonsignificant drop in blood pressure under covert communication from postarousal to postcounteraggression was maintained with no significant difference between the individual modes of fantasy and nonaggression.

Discussion

Evidence of Arousal Attainment

Of crucial importance to the design of this study was the assumption that a) Ss were aroused and/or frustrated, the premise being that for any successful effects of counteraggression one must be aroused and

permitted to counteraggress (Berkowitz, 1962; Feinbach, 1961). The counting task which constituted the frustration or arousal task was felt to be subjectively arousing as had been previously observed by Hokanson (1961). The constant interruptions and irritation to the ss when participating in ego-involved intellectual tasks was considered to be distressing by all those directly involved in the experiment. Experimental evidence for the actual attainment of the arousal effect is most pronounced on the physiological variable of systolic blood pressure.

Although one might agree that the task used in this study had arousing effects, it would be difficult to describe the task legitimately as frustrating and even less so as anxiety producing. It can probably best be said that whatever anxiety may be, it did not manifest itself in this study as measured by the IPAT anxiety scales. Most clearly we must accept the fact that the particular type of arousal used in this experiment may have had little or no effect on any type of subjective measure of anxiety.

The question could naturally arise as to whether anxiety is a critical factor in research such as this. According to the literature regarding aggression anxiety (Berkowitz, 1962) the answer would be affirmative. It may be legitimately questioned whether aggression anxiety is a concept quite different from the subjective, self-reported anxiety called for in the IPAT anxiety scale. One of two possible conclusions may be drawn from the present study: first, anxiety is not experienced, much less aggression anxiety; and secondly, if anxiety is present, the IPAT anxiety scale did not serve as a sensitive instrument for its measurement.

These conclusions about the role of anxiety in this model lead to suggestions for some further refinement. Investigators might look for a more suitable measure of anxiety if it is assumed to be present. The IPAT anxiety scale appears to be the most appropriate instrument to assess anxiety changes over a brief period of time (Schaier & Cattell, 1960). Most assuredly, further investigation must consider, among other things, the use of different modes of arousal which can create frustration and some measurable assessment of anxiety, preferably aggression anxiety.

At least as far as systolic blood pressure is concerned, the investigators have presented evidence that arousal occurred in the desired direction. Reference to the other physiological measures is to be considered later in more detail. On the other hand, evidence of arousal in the psychological realm was noticeably lacking. There may be some experience of anxiety but the tools of measurement used under these experimental conditions do not elicit such feelings in any objective manner.

The Measures of Arousal

Some more specific comments are now in order about the dependent variables used in this study. The three physiological measures were those commonly used in studies reported in the literature which employed models similar to ours (Hokanson & Burgess, 1962). As prior work has shown (Hokanson & Burgess, 1962) systolic blood pressure was most successful for the assessment of arousal in frustration counteraggression paradigms. This research tends to support previous findings in that there was the predicted change of blood pressure according to the arousal conditions. Likewise, there was a subsequent decrease of blood pressure which carries

across both control and experimental Ss.

Of some interest also were the rather scattered and unpredictable values of pulse rate and respiration indices. Probably most significant was the fact that even though all Ss were involved in the same arousal task, the pulse rate and respiration measures did not reflect the anticipated changes whereas blood pressure changed in the desired direction. More important, however, was the fact that regardless of the method of arousal, and particularly the one used in this study, there was a noteworthy effect on systolic blood pressure. But whatever such arousal may mean, it was not manifested in other commonly used physiological indices. It follows then that either this method of arousal may not be generalizable or the pulse rate and respiration measures are dependent upon some other mediating phenomena, in addition to or independent of the particular mode of arousal employed in the present study.

The other type of dependent variable was described as psychological; more specifically, anxiety as measured by Scheier and Cattell's IPAT 8 Parallel Form Anxiety Battery. This measure seemed particularly appropriate because much has been inferred about anxiety in this type of frustration counteraggression model. Previous studies have tried to uncover what was called some measure of hostility in response to TAT cards, or some other rather subjectively assessed notion (Rosenbaum & DeCharms, 1960; Feshbach, 1961).

Often speculated upon is a notion labeled aggression anxiety. This phenomenon seems summarily to represent some type of anxiety which results from the expression of aggression, in that some form of retaliation may

be forthcoming. It therefore seemed appropriate to try to tap some of this anxiety. In view of the lack of significant changes in the IPAT anxiety measure it seemed safe to say that whatever the anxiety scales measured, they did not tap the subjective feelings of discomfort raised by this model.

Future studies will need to make some attempt to measure both physiological and psychological components. The inferred relationship between the central and autonomic nervous systems' simultaneous arousal from experimental variables like those used in this study was not supported.

Direct versus Vicarious Response

Attention is now shifted to the relative impact of direct versus vicarious conditions of responding. The fact that any expression of aggression (socially approved or condemned) carries some intrinsic or extrinsic possibility of retaliation ought to be subjectively arousing. Therefore if a vicar or ally substitutes as the aggressor, then the imminent retaliation may not be threatening in that the target's recourse would probably be directed to the source of counteraggression. However, in the model used in this study, the presence or absence of a socially reinforcing agent did not constitute any significant difference in arousal. It was noted that the vicar served more as a companion whom the S could talk with, typically about topics which were not related to the task at hand. Likewise, a number of the Ss noted postexperimentally that the vicar was seen more as an ally of the instigator than of the S himself. This might suggest that regardless of how well the vicar is defined, his

role as a successful ally may rest more upon time-endorsed acquaintance than circumstantial presence in the environment. What might be suggested is that the vicar must be perceived by the S as an ally.

The Different Modes of Counteraggression

Next, the question of the modes of counteraggression needs to be evaluated. The two basic manifestations of counteraggression were in either an overt or covert manner. The overt modes of counteraggression carried with them the connotation that whatever counteraggression was expressed was to be done so directly to the instigator so that both he and the counteraggressor were consciously aware of the mode of expression.

Previous studies (Hokanson & Burgess, 1962) have concluded that when overt modes of counteraggression were used, the S perceived the injury to the instigator and therefore physiological arousal was reduced because of the completion of an action tendency. Because of these conclusions it was assumed that some resulting anxiety, be it aggression anxiety or not, came from the conscious injury to the instigator. The present study supported previous findings (Rosenbaum & DeCharms, 1960) regarding the physiological variable of systolic blood pressure but did not confirm the present investigator's hypothesis that anxiety would be lessened under covert modes of counteraggression. However, it was noted that when an opportunity to counteraggress under overt modes was permitted, significant lowering of blood pressure arousal level occurred. These effects did not appear for pulse rate and respiration. As in other studies, pulse rate and respiration did not tend to be as sensitive to the same stimuli as did blood pressure.

There is the suggestion that seeing the instigator injured appears to have some physiologically arousal reducing effects on the S. This effect was noted regardless of the presence or absence of the vicar. Thus what was crucial seemed to be the perception of the instigator's being injured regardless of who accomplished the injury, just as long as the aroused S actually perceived the counteraggression. Previous conclusions (Hokanson & Shacter, 1961; Hokanson & Burgess, 1962) were certainly supported in that some arousal reducing effect was noted if an aroused individual was given the opportunity to communicate behaviorally with the instigating individual.

Also supporting previous findings (Hokanson & Burgess, 1962) was the failure to demonstrate a significant arousal reducing effect for blood pressure under a covert mode of counteraggression. Under these conditions the S did not perceive his mode of counteraggression as having overtly injurious (to the instigator) effects. Hence, arousal was maintained because there was apparently no completion of an action tendency. Hypothetically, the S's inability to communicate his feelings has the safety device of not leaving him vulnerable to further retaliation by the instigator. There should thus be little psychological change in arousal. Here, as with overt communication, conclusions are quite tenuous in view of the inability to demonstrate any initial psychological arousal. It seemed reasonable to conclude that covert methods of communication may have arousal sustaining rather than reducing effects.

Multidimensional Analysis of Response to Frustration

One feature of the present study was to combine much of what has

been tried before into a single multidimensional design which could account for the interaction of variables previously studied only in bivariate designs. For example, individual studies have dealt with the frustration-counteraggression model with respect to the use of physiological variables alone (Hokanson & Burgess, 1962). Others have studied counteraggression under the four individual modes of physical, verbal, fantasy and no aggression (Rosenbaum & DeCharms, 1962). Still others have tried to assess resulting hostility through any number of subjective devices (Feshbach, 1961).

On other levels, investigators have sought answers to many questions posed by vicarious experiences (Berkowitz, 1962). Most of these studies have reported results which support their hypothetical positions. The present study makes some serious effort to assess the interaction of all these findings and tries to see if previous findings can be supported as part of a complex design.

More effective agents of arousal must be sought. In addition, realistic conditions under which such behavior is seen in the real world must be more nearly approximated. Once effective arousal is accomplished, it is then necessary to find an appropriate measure of arousal along psychological dimensions. The IPAT anxiety scale did not appear to reflect objectively what was subjectively observed in other studies. The whole issue of the psychological components of this model needs further examination and refinement.

Assessment of physiological variables both in this study and others might be more accurate if the S's ability to move could be restricted

without creating a massive degree of anxiety. Artifacts due to movement recorded by sensitive equipment appear to be a serious impediment in a study utilizing gross physiological measures.

If these two refinements were made, it might be extremely interesting to manipulate the social status value of the instigator and/or vicar. Previous studies (Berkowitz, 1962) have noted that these two types of variables were quite important. Although this study attempted to place the vicar and instigator in a situation to elicit maximal permissiveness for counteraggression, one cannot be entirely certain that the S's reaction would not be accentuated by differing social stimuli. It might be reasonable to assume some changes in anxiety or physiological arousal would occur if the instigator were seen as being more authoritarian. These speculations, however, can only be supported by further investigations.

Conclusions

Systolic blood pressure was found to be the most reliable measure of arousal reflecting the changing experimental conditions from baseline to postarousal to postrelease (resting or counteraggression). Pulse rate and respiration did not show any systematic effects attributable to experimental manipulation. In addition, no objective evidence of psychological arousal was obtained. The IPAT anxiety scales appeared to be insensitive to the type of arousal produced in this model.

The effects of direct and vicarious means of expressing aggression could not be differentiated. However, vicarious expression did reflect some opportunity for verbal social interaction. Overt communication of

aggression toward the instigator was found to be the most effective way of achieving physiological reduction of arousal. There appeared to be some satisfaction in seeing an action sequence terminated by perceiving injury to the instigator.

The multidimensional approach, although requiring methodological refinement, appears to be an appropriate way to investigate the complexities involved in the social-psychological nature of the frustration (arousal) aggression paradigm.

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Footnotes

1. Paper presented at the meeting of the Midwestern Psychological Association, Chicago, May 4-6, 1967. The complete version of this research was submitted to the Faculty of the Graduate School of West Virginia University, Morgantown, as a dissertation in partial fulfillment of the requirements for the PhD degree.

2. Now at Fitzsimons General Hospital, Denver, Colorado 80240.

Table 1
 Mean Physiological and Psychological Changes
 for All Three Phases

Phases	Arousal Indices			
	Blood Pressure	Pulse Rate	Respiration	Anxiety
Phase I	129.77 ^a	86.92 ^b	19.86 ^b	6.13 ^a
Phase II	137.20 ^b	85.89 ^{a,b}	18.73 ^a	6.13 ^a
Phase III	131.03 ^a	84.49 ^a	18.67 ^a	6.21 ^a

Note.--For each of these measures, cells having any superscript in common are not significantly different (at or beyond the .01 level) by Duncan's Multiple Range Test. Each mean is based on 128 SS.

Table 2
Analysis of Variance of Arousal Measures

Source	df	Arousal Indices							
		MS	F	Blood Pressure	Pulse Rate	Respiration	Anxiety		
Between subjects	127								
Control-Experimental (A)	1	653,649	1.392	358,440	<1	2.667	<1	2.25	<1
Vigorous-Direct (B)	1	177,399	<1	146,274	<1	24,000	<1	8.64	<1
A x B	1	470,377	1,002	11,690	<1	.093	<1	1.60	<1
Error between	124	459,308		467,709		35,604		3.03	
Within subjects	258								
Occurrence of measure (C)	2	2024,987	107,77*	190,347	9.75*	57,167	16,171*	.30	<1
A x C	2	20,914	1,113	69,143	3.54	12,323	3,485	.75	<1
B x C	2	3,820	<1	.383	<1	1,219	<1	.025	<1
A x B x C	2	59,069	2,663	10,273	<1	.657	<1	.815	<1
Residual between	248	18,789		19,523		3,535		.842	

*2 < .01.

Table 3
 Analysis of Variance of Arousal Measures within the Counteraggression Group

Source	df	Arousal Indices											
		Blood Pressure		Pulse Rate		Respiration		Anxiety					
		MS	F	MS	F	MS	F	MS	F				
Between subjects	127												
Direct-Vicarious (A)	1	35.021	<1	37.631	<1	12.505	<1	1.40	<1	13.98	4.438		
Overt-Covert (B)	1	1.688	<1	18.797	<1	1.172	<1	3.91	1.241				
A x B	1	204.187	<1	931.921	1.611	135.005	4.232	3.15					
Error between	60	476.432		578.174		31.900							
Within subjects	128												
Occurrence of measure (C)	2	1010.005	71.328*	45.329	1.937	19.224	5.941*	.990	1.544				
A x C	2	13.287	<1	7.253	<1	.880	<1	.500	<1				
B x C	2	176.359	12.454	3.109	<1	2.016	<1	.015	<1				
A x B x C	2	6.579	<1	23.079	<1	3.059	<1	.210	<1				
Residual within	120	14.160		23.292		3.291		.641					

*p < .01.

Table 4
 Mean Changes of Arousal Within the
 Counteraggression Group

Phases	Arousal Indices			
	Blood Pressure	Pulse Rate	Respiration	Anxiety
Phase I	128.13 ^a	87.05 ^a	19.72 ^b	6.15 ^a
Phase II	135.80 ^b	87.38 ^a	19.17 ^{a,b}	6.17 ^a
Phase III	130.17 ^a	85.78 ^b	18.63 ^a	6.38 ^a

Note.--For each of these measures, cells having any superscript in common are not significantly different (at or beyond the .01 level) by Duncan's Multiple Range Test. Each mean is based on 64 SS.

Baker

Table 5

Mean Blood Pressure Changes as a Function of Overt
and Covert Counteraggression

Phases	Mode	
	Overt	Covert
Phase I	129.25 ^{a,b}	127.00 ^a
Phase II	136.38 ^d	135.22 ^{c,d}
Phase III	128.19 ^a	132.16 ^{b,c}

Note.--For this table, measures having any superscript in common are not significantly different (at or beyond the .01 level) by Duncan's Multiple Range Test. Each mean is based on 32 Ss.

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Figure Caption

Figure 1. Subjects under various experimental conditions.

EXPERIMENTAL
(Counteraggression)

CONTROL
(Rest)

	Direct	Vicarious	Direct	Vicarious
Overt	16	16	32	32
Covert	16	16		