4-1968

Two Indices of Aggression: Aggressive Fantasy and Change in Pupil Size

Filipinas S. Tinio

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TWO INDICES
OF AGGRESSION: AGGRESSIVE
FANTASY AND CHANGE IN PUPIL SIZE

by
Filipinas S. Tinio

A Thesis
Submitted to the
Faculty of the School of Graduate
Studies in partial fulfillment
of the
Degree of Master of Arts

Western Michigan University
Kalamazoo, Michigan
April 1968
ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to Dr. Malcolm H. Robertson for his encouragement and advice in preparing this thesis. My thanks go to Dr. Frank Fatzinger whose guidance has been indispensable as well as to Dr. Christopher Koronakos for his constructive criticism. I owe special gratitude to James Buchanan and Roy D. Adler, both of whom have given me much needed technological help. And to the many others who, in one way or another, have made this study possible, I thank them deeply.

Filipinas S. Tinio
TINIO, Filipinas Santos
TWO INDICES OF AGGRESSION: AGGRESSIVE FANTASY AND CHANGE IN PUPIL SIZE.

Western Michigan University, M.A., 1968
Education, psychology
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INTRODUCTION

The present study investigated aggression using both a projective test and a physiological measure of aggression. A considerable amount of research on aggression has been done using projective tests, particularly the Thematic Apperception Test (TAT). Although there is a general agreement that the virtue of the TAT lies in its ability to tap the covert or repressed level of behavior (Bellak, 1950; Murray, 1951; Tomkins and Tomkins, 1955), Lindzey and Tejessy (1956), on the basis of their own research, have cautioned against making this assumption. Following the original hypothesis, they predicted the greatest correlation between measures of aggression and aggression derived from clinical ratings based on test results, autobiographical and interview data, but which gave a greater weighting to covert materials. They predicted that the measures of aggression based on the Rosenzweig Picture-Frustration Study and observer ratings would be intermediate in the magnitude of their relationship to the TAT, and that the lowest correlation would be between TAT aggression measures and the subjects' self-ratings. The results failed to bear out their expectations, but instead showed the highest positive correlation to be between TAT aggression scores and the subjects' self-ratings.

Buss (1961) has concluded that the TAT reveals those aggressive trends which normal subjects, if given the opportunity, can verbalize. Allport (1965) has expressed the same view when he limits the use of
projective tests to highly defensive subjects, because with normal people self-report techniques are just as valid as projective instruments.

A variable which determines whether a test elicits aggression is the amount of inhibition present. Since aggression is a socially unacceptable impulse, individuals vary in their freedom of expression, depending on the amount of anticipated punishment or disapproval from themselves or others (Berkowitz, 1962). As Murstein and Wiens (1965) have suggested, the lower class is more inclined toward overt expression of aggressive feelings because of weaker inhibitions compared to the middle or upper class who generally allows only indirect modes for expressing aggression.

An element relevant to the degree of projection on the TAT is the ambiguity or structuredness of the cards. Ambiguity refers to the equivocal quality of the pictures so that they can be interpreted in more than one way (Murstein, 1965a). Murstein (1963) has suggested that cards highly structured for a given dimension are most useful when the expression of the drive is unacceptable and inhibitory tendencies greatly pronounced. Thus, subjects who become anxious and avoid giving the response the card seems to call for are readily differentiated from those who have no conflict in this area and who follow the stimulus-pull of the card.

Kagan (1956) imposed a limit to the amount of structure since non-psychotic subjects strove to be accurate in their interpretation of external stimuli. He used pictures which depicted fighting but which could still elicit non-aggressive stories without serious
distortion of the stimuli. Ambiguity should be in the direction of what is happening, why, and how it will end, but the who should be fairly clear; that is, figures should be readily identifiable as to age, sex, and their relationship to each other (Murstein, 1963). Cards having figures of both sexes have been shown to be maximally sensitive to projection (Murstein, 1964; 1965b).

Although studies on aggression have frequently utilized projective tests, insofar as aggression can be assumed to be an emotional reaction which involves the autonomic nervous system, the use of a physiological measure may be feasible.

There is an increasing amount of evidence that pupil responses can indicate ongoing activities of the nervous system including, but not restricted to, the effects of visual stimulation (Hess and Polt, 1960; Hess, 1965). It has been noted that pupillary activity is controlled by either one of the two divisions of the nervous system. The parasympathetic division initiates changes in pupil size as a result of variability in environmental light conditions. But the sympathetic nervous system can also mediate pupillary changes independent of changes in light intensity. Pupils have been found to dilate in response to interesting stimuli or pleasant emotions; they have been observed to constrict upon presentation of aversive stimuli or in association with negative emotional reactions.

Hess and Polt (1960) did preliminary studies with animals and observed marked pupillary dilation under constant light conditions in response to stimuli such as a relatively strange cat introduced into the home territory, a familiar object of play, and food. When the
food was wrapped in paper or if it was foreign to the animal's normal diet, maximal dilation did not occur until the animal smelled the food.

To test whether similar changes could be observed in humans as well, they made a pilot study using four men and two women. They got greater pupillary dilation among the males at the sight of a partially nude woman, but the female subjects showed a greater response to the picture of a mother holding a young child, a partially nude man, and a baby.

The studies were extended to other modalities and, in most cases, the results were inconclusive but encouraging. Although research in pupillometry is in its infant stage, its possibilities seem to be numerous and the field appears to be a promising area for fruitful research.

In addition to using the TAT as a measure of aggression, the present study also explored the possibility of using the pupil response as an index of aggression. Assuming that potentially aggression-evoking pictures would stimulate hostile feelings in the subject, it was hypothesized that the emotional reaction would elicit some kind of pupil response. It was further assumed that highly aggressive subjects would have a lower aggression threshold and, therefore, would be more sensitive to the hostile qualities of the stimulus pictures. Assuming hostile feelings to be unpleasant, it was predicted that highly aggressive subjects would show greater pupil constriction than the less aggressive ones.
In summary, the present study investigated the use of the TAT and pupil size as measures of aggressive feelings as well as the relationship between the two types of indices. A modified form of the Buss-Durkee Hostility Inventory (Buss and Durkee, 1957) was made the criterion for the amount of aggression. It was hypothesized that: (a) the high scorers on the hostility questionnaire categorized as the high aggressive group would have high TAT aggression scores, and the low scorers would correspondingly show little aggression on the TAT; (b) the high aggressive group would show greater pupil constriction than the low aggressive group. Consequently, it was expected that pupil constriction would be associated with high aggression scores on the TAT.
METHOD

Subjects: The sample consisted of 26 white, male, undergraduate students whose ages ranged from 18 to 26. They were selected from a group of 99 volunteers on the basis of very high or very low scores on the hostility questionnaire. They did not know the purpose of the experiment; they were merely told that the investigator was doing a study on college students.

The aggression questionnaire used was the modified Buss-Durkee Hostility Inventory. Buss and Durkee (1957) constructed a 75-item questionnaire which is assumed to tap various aspects of hostility. The Inventory has an advantage over the other existent aggression scales in that it attempts to minimize the factor of social desirability or the examinee's desire to put himself in a favorable light. But like other hostility scales, the norms based on college students are still tentative. However, since the subjects in the experiment were also undergraduates, it seemed safe to assume the suitability of the norms.

The investigator inserted filler items taken at random from the Minnesota Multiphasic Personality Inventory in order to mask the nature of the test. Instead of the original 75-item inventory, the modified questionnaire consisted of 100 items. The test instructions were adapted from the MMPI. The modified Inventory is given in Appendix A.

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The highest and the lowest scorers were selected to serve as subjects in the experiment. This was done by setting up a frequency distribution of all the scores on the Inventory. The 18 subjects who fell one standard deviation or more above the mean of this distribution were classified as high aggressive. The low aggressive group included 16 subjects who scored one standard deviation or less below the mean. But the data on eight subjects had to be disregarded. Five wore glasses which gave reflections that covered either part of or the entire pupil in the photograph. One trial was missing in two subjects and it could not be ascertained on which stimulus picture the omission was done. The eighth was a case of defective film processing which caused the loss of all three trials on a stimulus slide. The sample was reduced to 26, with 14 in the high aggressive (HA) group and 12 in the low aggressive (LA) group.

To eliminate the possibility of differential treatment of subjects, the grouping was done by an outsider so that the investigator had no knowledge of the classification of the subject until after the data had been analyzed.

**Apparatus:** A simplified pupil-response apparatus was used. Seated on a chair, the subject was asked to peer into a black plywood box, 16" x 24" x 16", with a light gray interior. A mirror reflected black and white pictures flashed from a slide projector onto a 7 3/4" x 15" screen. The projector mounted on the right side was at the end of the box nearer the subject. With a white baffle plate shielding the eye from direct glare of a 7 1/2 watt white bulb on the
lower left-hand corner of the box and with the projector turned on, the interior of the box had a light meter reading of 17.* The slides toned down the illumination with a reading ranging from 15 to 15.5.* Other than the dim lamp used by the experimenter to read the stopwatch and which did not significantly change the illumination of the interior of the box, there was no other lighting in the room.

A Minolta single lens reflex camera, 35 mm., was mounted at the end of the black box opposite the subject. Pictures of the subject's eyes were taken with the F setting at 1.4 at 1/250 second. Three pictures were taken for each slide and the time intervals observed were as follows: (a) 1 sec. after slide presentation; (b) after 5 more sec.; (c) 10 sec. after the subject started his story. There were 30 exposures for each subject. Figure 1 shows a diagram of the pupil-response apparatus used.

*For the interested reader, the light meter reading may be converted into footcandles by checking a conversion table for the Grand Knight exposure meter.
Figure 1

Top view of the pupil-response apparatus
The stimulus slides were selected from TAT cards. Five hostile and five control slides were presented. A description of the slides, given in the order in which they were shown, is found in Appendix B. The choice of the aggressive cards was partly based on Jensen's (1957) pilot study in which the TAT pictures were ranked according to their power to elicit aggressive themes, and partly on the investigator's judgment of the suitability of the cards. All the hostile cards except BEM were in Jensen's list of the ten most fruitful pictures in eliciting aggression.

Two tape recorders were on hand during the experiment. One played back the instructions to the subject; the other one was used in recording the subject's stories.

Procedure: The subject was taken to the testing room and seated on a chair in front of the pupil-response apparatus. The room was dark, except for the light from the projector, the 7½ watt bulb inside the experimental box, and the dim lamp on the left side of the experimenter who was seated across the subject. The subject was asked to seat himself in the most comfortable position. He was told that his task would be to peer into the box and look at the screen on which pictures would be projected. It was emphasized that he should not move and should maintain the proper viewing position throughout the experiment; that is, his eyes should be brought as close as possible to the peek hole, his forehead nestling against the box, and his nose resting on the ledge of the peek hole.

Afterwards, the projector was turned off and the subject was asked to listen to the taped instructions, as follows:
Listen carefully to these instructions. You are now going to take part in an experiment on interest among college students. As you peer into the box in front of you, you will be shown a series of pictures, one at a time. I want you to tell a story about the picture. But don't start until I say the word "alright". In your story, tell me what is happening at the moment as you see it in the picture, what the characters' thoughts and feelings are. Then tell me what happened in the past that could have led up to the situation depicted in the picture. Lastly, tell me what the outcome is going to be. In short, each of your stories will have the elements of present, past, and future. And don't forget to tell me what the characters are thinking and feeling. You can spend about 5 minutes with each picture. Indicate whenever you are through with your story.

(Short pause) Remember that there is no right or wrong way of telling a story. Relax and speak your thoughts as they come. You may hear the camera click every now and then, but don't let this bother you. Make sure that you understand the instructions before you proceed.

The projector was then turned on and the subject was asked if he had any questions. Any questions were answered in a noncommittal manner. When the subject was ready, the slides were shown in the same order for all subjects. The duration of the picture presentation depended on the length of the subject's story. An inquiry was conducted whenever necessary, e.g. "What will happen?", if the outcome was omitted. While the stories were being tape recorded, the examiner took pictures of the subject's eyes according to the required time intervals. The entire experiment lasted for an average of 30 to 40 minutes.
RESULTS

The TAT stories were scored by two judges, the investigator and a faculty member, using Hafner and Kaplan's (1960) five-point hostility weighted score scale. The scale is given in Appendix C.

The Pearson r was computed to test the degree of agreement between the two judges' ratings. The correlation was .87 (r.001 = .61) which warranted taking the average of the ratings per picture. The TAT hostility score of each subject was the sum total of the averages of the ratings on the five hostile pictures. The sum total of the averages of the ratings on the five control pictures was also obtained.

It was necessary to determine whether the hostile and control pictures really differed in eliciting aggression. A "t" test was used to compare the responses of the high aggressive (HA) group to the hostile and control pictures. The same procedure was used with the low aggressive (LA) group. A summary of the "t" test is given in Table 1.

Table 1
Comparison within each group of the TAT hostility scores on the hostile and control pictures

<table>
<thead>
<tr>
<th>Pictures</th>
<th>HA group</th>
<th>LA group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Hostile</td>
<td>15.714</td>
<td>7.370</td>
</tr>
<tr>
<td>Control</td>
<td>5.000</td>
<td>4.140</td>
</tr>
</tbody>
</table>

"t" = 6.743* "t" = 7.122* *P<.0005

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The "t" test indicated that each group responded with more aggression to the hostile pictures. The hypothesis that there was no difference between the hostile content of the responses to the hostile and control pictures was rejected beyond the .01 point of confidence.

The stories of the HA group and LA group in response to the hostile pictures were compared. The results indicated that the HA group projected more hostile content than the LA group. The difference between the two groups was significant at the .05 point of confidence. A summary of the "t" test is shown in Table 2.

Table 2
TAT hostility scores of HA group and LA group on the hostile pictures

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA</td>
<td>15.714</td>
<td>7.370</td>
</tr>
<tr>
<td>LA</td>
<td>10.583</td>
<td>3.006</td>
</tr>
</tbody>
</table>

"t" = 2.295*

*P < .05

The stories of the HA group and LA group on the control pictures were also compared. A summary is given in Table 3.

Table 3
TAT hostility scores of HA group and LA group on the control pictures

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA</td>
<td>5.000</td>
<td>4.140</td>
</tr>
<tr>
<td>LA</td>
<td>3.083</td>
<td>3.303</td>
</tr>
</tbody>
</table>

"t" = 1.239 ns
Although there was a tendency for the HA group to project more hostile content in the control pictures, the trend was not significant. The hypothesis that the HA group and LA group did not differ in their responses to the control pictures was not rejected.

Pupil size was taken by measuring with a vernier caliper the diameter of the pupil of the left and right eyes. This was done by running the negatives through a film strip projector and measuring the projection on the wall. The unit of measurement was millimeters. Due to technical shortcomings, oftentimes there were differences in the measurements of the right and left pupils most likely because their distance from the camera lens was not the same. The camera had been pre-set to focus on both eyes. A better method would have been to focus on only one eye. The average of the pupil reactions of both eyes was obtained. The pupil measurement per stimulus picture was, ideally, the mean of three trials. Twelve subjects had a complete set of thirty exposures. But in twelve others, there was either a slide or two which had only two trials because the subject had blinked. In two more cases, two trials were missing. Since the loss occurred in only one stimulus picture, the data were still used. The sum total of the pupil measurements on the five hostile pictures as well as on the five control pictures was obtained for each subject.

The procedure used in the analysis of the pupil response was similar to the TAT. The responses of each group to the hostile and control pictures were compared to determine whether they differed in eliciting pupil change. Dilation rather than constriction was found
to be associated with the hostile pictures. The "t" test showed that there was greater dilation in response to the hostile pictures. The reactions to the hostile and control pictures differed significantly at the .02 point of confidence in the HA group and beyond the .01 point of confidence in the LA group. Table 4 gives a summary of the "t" test.

Table 4
Comparison within each group of the pupil measurements on the hostile and control pictures

<table>
<thead>
<tr>
<th>Pictures</th>
<th>HA group</th>
<th>LA group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Hostile</td>
<td>10.245</td>
<td>0.655</td>
</tr>
<tr>
<td>Control</td>
<td>10.003</td>
<td>0.763</td>
</tr>
</tbody>
</table>

"t" = 2.396*  "t" = 3.210**

*P < .025  **P < .005

However, when the HA group and LA group were compared in their reaction to the hostile pictures, no significant difference was obtained. A summary of the t test is shown in Table 5.

Table 5
Pupil measurements of the HA group and LA group on the hostile pictures

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA</td>
<td>10.245</td>
<td>0.655</td>
</tr>
<tr>
<td>LA</td>
<td>9.927</td>
<td>0.609</td>
</tr>
</tbody>
</table>

"t" = 1.223 ns

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Neither did the pupil response of the HA group and LA group differ significantly on the control pictures. Table 6 shows the comparison with the use of the "t" test.

Table 6
Pupil measurements of the HA group and LA group on the control pictures

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA</td>
<td>10.003</td>
<td>0.763</td>
</tr>
<tr>
<td>LA</td>
<td>9.667</td>
<td>0.639</td>
</tr>
</tbody>
</table>

"t" = 1.159 ns

The TAT scores and pupil measurements were plotted on a scattergram to determine whether the Pearson r or a correlational technique for curvilinear relationships was appropriate. The scatterplot failed to suggest a linear relationship. The correlation ratio or eta coefficient was used to ascertain the degree of relationship between the TAT and pupil size. The significance of the eta coefficient was evaluated by means of the F test. A summary of the analysis is given in Table 7.

Table 7
The relationship between TAT hostility scores and pupil measurements using the correlation ratio

<table>
<thead>
<tr>
<th></th>
<th>Eta coefficient for $x$ (TAT hostility scores)</th>
<th>Eta coefficient for $y$ (pupil measurements)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n_{xy}$</td>
<td>$F$</td>
</tr>
<tr>
<td>Hostile</td>
<td>.570</td>
<td>0.378</td>
</tr>
<tr>
<td>Control</td>
<td>.437</td>
<td>0.207</td>
</tr>
</tbody>
</table>
Not one of the F values was significant. This fails to indicate that the two measures are related to one another.
DISCUSSION

The analysis of the data supported the hypothesis of a direct relationship between the modified Buss-Durkee Hostility Inventory and the TAT hostility scores. The group that scored high on the Inventory gave stories with more aggressive content to the TAT hostile pictures than the group that scored low. The results were in the direction of Buss' (1961) contention that the TAT revealed the conscious aspects of aggression. He has given two reasons why the TAT taps the conscious level: (a) the relative unambiguity of the stimuli; (b) the subject's own guardedness. Unlike the Rorschach which is highly unstructured, the TAT pictures are less ambiguous and more readily suggest to the subject possible situations which are being depicted in the pictures. The normal subject is more aware of the stimulus pull and consciously decides whether he wants to follow it or not. He screens his response and gives what is acceptable to him.

It was reasonable to expect that the subjects who were willing to reveal their aggressive tendencies on the questionnaire would likewise be less inhibited in expressing aggression on the TAT. That it was aggression that was being elicited was borne out by the fact that there was no significant difference between the two groups on the control pictures. The high aggressive group had a higher mean TAT hostility score but the difference did not achieve statistical significance. This could mean that they felt free enough to project
a very strong need on neutral stimuli, but they were still able to discriminate appropriate from inappropriate outlets.

The data on pupil change did not prove to be as encouraging. The experimenter obtained dilation instead of the hypothesized constriction. But the high aggressive group did not show any more significant dilation than the low aggressive group in response to the hostile pictures. The explanation seemed to lie in the character of the groups themselves for it was shown that, within each group, dilation was significantly greater with the hostile pictures. It should be noted that dilation was defined in relative terms, that is, the pupil changes on the control pictures served as the baseline with which the pupil responses to the hostile pictures were compared.

One possible explanation could be the factor of homogeneity. The groups were set up on the basis of a questionnaire. The subjects were fully aware of how much they wanted to reveal in the test. The Inventory and the TAT were positively related because both elicited conscious, voluntary responses. However, pupil change is an involuntary reaction of which the individual has no control or awareness. It might be possible that not all the subjects in the high aggressive group were truly highly aggressive or those in the low aggressive group the least aggressive. There would be a false grouping if there were some who made themselves appear more aggressive than what they actually were or if there were any who either repressed or consciously denied hostility. That pupil response and the TAT were two different measures was shown by a very low correlation. It would be interesting to find out if the Rorschach as a criterion would yield a different result since it is
an often made assumption that the Rorschach taps the covert, unconscious facets of the personality.

Another reason could be that, like anxiety, only a comparison of the pathologically aggressive and least aggressive individuals would prove fruitful. A majority of the studies have not found any relationship between anxiety in a normal population and sympathetic reactivity (Valins, 1967); the same could be true for aggression. Further research can shed some light on the gradient of pupil change.

The question arises why dilation was found to be associated with the hostile pictures. Certain authorities, particularly Langworthy, believe that the size of the pupil is mainly governed by parasympathetic activity through the stimulation of the constrictor musculature; the sympathetic mediates through the blood vessels of the iris (DeJong, 1958). Whereas the function of the parasympathetic is anabolic and conserves energy, the sympathetic system mobilizes the organism in response to emotional stress. Hess (1965) obtained pupil dilation in some subjects upon presentation of a group of "negative" stimuli, e.g. pictures of corpses in a concentration camp, because of an additional "shock" content. The hostile pictures in the present experiment might have elicited a strong emotional reaction which, in turn, activated the sympathetic nervous system causing dilation of the pupils. Probably Hess' pleasant-dilation-unpleasant-constriction model holds only for moderate stimuli on the pleasant-unpleasant continuum. Since the aggressive need involves social values, it may invariably have a "strong" emotional content. A more sophisticated experimentation correlating
pupil size with other physiological indices of sympathetic activity, e.g. galvanic skin response, heart rate, might be suggested.

Whether the pupil responses were measures of the subject's hostile feeling or the mental activity going on while making up and telling a story might be considered. Hess and Polt (1963) have confirmed the observation made more than half a century ago that problem-solving activities cause the pupils to dilate. A change in methodology wherein the subject merely views hostile pictures and the pupil change is therein recorded could check for this factor.

Finally, it is possible that the apparent differences between the hostile and control pictures were merely artifacts due to limitations in methodology. The photographic technique left much to be desired, and this should be taken into consideration in the evaluation of the data. In addition, since no interval was allowed between pictures, it could not be ascertained whether the pupil response was contaminated with any carry-over effect from the preceding picture.
SUMMARY

Considerable research efforts have been directed to the psychological measurement of aggression. Summing up the research findings, Buss (1961) has concluded that the TAT reveals aggression which a normal individual is aware of and can verbalize. Thus, the present study predicted a direct relationship between the modified Buss-Durkee Hostility Inventory and the TAT hostility scores. The feasibility of using a physiological index of aggression was also explored. Based on the theory that interesting stimuli or pleasant emotions caused pupil dilation while aversive stimuli or negative emotions led to constriction (Hess and Polt, 1960; Hess, 1965), it was also hypothesized that the high scorers on the Inventory would show greater pupil constriction in response to the hostile pictures than the low scorers.

To test the hypotheses, 14 high aggressive subjects and 12 low aggressive subjects were selected on the basis of their scores on the modified Buss-Durkee Hostility Inventory. All subjects were asked to tell stories to five hostile pictures and five control slides, all of which were taken from the TAT set. As they were viewing the slides, pictures of the pupils were taken at three time intervals. The stories were scored by two judges, the investigator and a faculty member, using Hafner and Kaplan's (1960) five-point hostility weighted score scale. Pupil size was obtained by measuring the diameter of the left and right pupils and taking the average of the two. The pupil measurement for each stimulus
picture was the mean of three trials. The shortcoming of the methodology was cited.

A series of $t$-tests were run. The hostile pictures consistently elicited more hostile content ($P<.0005$) than the control pictures. Taking only the hostile pictures, the high aggressive group significantly projected more hostility ($P<.05$) than the low aggressive group. There was no significant difference between the two groups on the control pictures.

Pupil dilation rather than constriction was obtained in response to the hostile pictures. The HA group showed more dilation to the hostile pictures ($P<.025$) than to the control pictures; the LA group showed a similar pattern ($P<.005$). But a comparison of the HA group and LA group in their reaction to the hostile pictures did not yield a significant difference.

The results support the hypothesis that the TAT taps the conscious aspects of aggression. Buss (1961) explains it in terms of the nature of the TAT pictures. The failure of the pupil response data to discriminate between the high aggressive and the low aggressive group on the hostile pictures indicates a need for further research. A number of reasons were offered for the fact that dilation rather than constriction was found to be associated with the hostile pictures. Possible changes in methodology were discussed.
REFERENCES


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APPENDIX A

Modified Buss-Durkee Hostility Inventory

All items followed by a number in parentheses are taken from the MMPI. The number corresponds to the number of the item as it appears in the MMPI.

Instructions: This is a personality questionnaire and not an intelligence test. Read each statement and decide whether it is TRUE AS APPLIED TO YOU or FALSE AS APPLIED TO YOU. Be sure to give YOUR OWN HONEST OPINION of yourself. Answer ALL the items. Erase completely any answer you wish to change.

1. I am afraid to be alone in the dark. (388)
2. I seldom strike back, even if someone hits me first.
3. I sometimes spread gossip about people I don't like.
4. Unless somebody asks me in a nice way, I won't do what they want.
5. Several times I have been the last to give up trying to do a thing. (534)
6. I lose my temper easily but get over it quickly.
7. I don't seem to get what's coming to me.
8. Often I feel as if there were a tight band about my head. (114)
9. I know that people tend to talk about me behind my back.
10. When I disapprove of my friends' behavior, I let them know it.
11. The few times I have cheated, I have suffered unbearable feelings of remorse.
12. Once in a while I cannot control my urge to harm others.
13. Most any time I would rather sit and daydream than to do anything else. (40)
15. Sometimes people bother me just by being around.
16. When someone makes a rule I don't like I am tempted to break it.
17. I like mannish women. (514)
18. Other people always seem to get the breaks.
19. I tend to be on my guard with people who are somewhat more friendly than I expected.
20. I often find myself disagreeing with people.
21. The one to whom I was most attached and whom I most admired as a child was a woman. (Mother, sister, aunt, or other woman.) (562)
22. I sometimes have bad thoughts which make me feel ashamed of myself.
23. I can think of no good reason for ever hitting anyone.
24. When I am angry, I sometimes sulk.
25. I have difficulty in starting to do things. (259)
26. When someone is bossy, I do the opposite of what he asks.
27. I am irritated a great deal more than people are aware of.
28. I think that I feel more intensely than most people do. (299)
29. I don't know any people that I downright hate.
30. There are a number of people who seem to dislike me very much.
31. I am a good mixer. (57)
32. I can't help getting into arguments when people disagree with me.
33. People who shirk on the job must feel very guilty.
34. I have often lost out on things because I couldn't make up my mind soon enough. (147)
35. If somebody hits me first, I let him have it.
36. When I am mad, I sometimes slam doors.
37. I am always patient with others.
38. Occasionally when I am mad at someone, I will give him the "silent treatment".
39. I have more trouble concentrating than others seem to have. (356)
40. When I look back on what's happened to me, I can't help feeling mildly resentful.
41. There are a number of people who seem to be jealous of me.
42. I demand that people respect my rights.
43. I often think, "I wish I were a child again." (398)
44. It depresses me that I did not do more for my parents.
45. Whoever insults me or my family is asking for a fight.
46. I never play practical jokes.
47. I worry quite a bit over possible misfortunes. (431)
48. It makes my blood boil to have somebody make fun of me.
49. When people are bossy, I take my time just to show them.
50. Almost every week I see someone I dislike.
51. I feel sympathetic towards people who tend to hang on to their griefs and troubles. (489)
52. I sometimes have the feeling that others are laughing at me.
53. Even when my anger is aroused, I don't use "strong language".
54. I am concerned about being forgiven for my sins.
55. People who continually pester you are asking for a punch in the nose.
56. I never worry about my looks. (240)
57. I sometimes sput when I don't get my own way.
58. If somebody annoys me, I am apt to tell him what I think of him.
59. I am likely not to speak to people until they speak to me. (292)
60. I often feel like a powder keg ready to explode.
61. Although I don't show it, I am sometimes eaten up with jealousy.
62. My motto is "Never trust strangers."
63. Once in a while I think of things too bad to talk about. (15)
64. When people yell at me, I yell back.
65. I do many things that make me feel remorseful afterwards.
66. When I really lose my temper, I am capable of slapping someone.
67. Since the age of ten, I have never had a temper tantrum.
68. When I get mad, I say nasty things.
69. I loved my father. (65)
70. I sometimes carry a chip on my shoulder.
71. If I let people see the way I feel, I'd be considered a hard
    person to get along with.
72. I commonly wonder what hidden reason another person may have for
    doing something nice for me.
73. When I am bored, I like to stir up some excitement. (181)
74. I could not put someone in his place, even if he needed it.
75. Failure gives me a feeling of remorse.
76. I am afraid when I look down from a high place. (166)
77. I get into fights about as often as the next person.
78. I can remember being so angry that I picked up the nearest
    thing and broke it.
79. I often make threats I don't really mean to carry out.
80. I can't help being a little rude to people I don't like.
81. I have reason for feeling jealous of one or more members of my
    family. (247)
82. At times I feel I get a raw deal out of life.
83. I used to think that most people told the truth but now I know
    otherwise.
84. I generally cover up my poor opinion of others.
85. I wish I were not bothered by thoughts about sex. (297)
86. When I do wrong, my conscience punishes me severely.
87. If I have to resort to physical violence to defend my rights, I
    will.
88. If someone doesn't treat me right, I don't let it annoy me.
89. I am not unusually self-conscious. (371)
90. I have no enemies who really wish to harm me.
91. When arguing, I tend to raise my voice.
92. I often feel that I have not lived the right kind of life.
93. I have known people who pushed me so far that we came to blows.
94. I am easily embarrassed. (321)
95. I don't let a lot of unimportant things irritate me.
96. I seldom feel that people are trying to anger or insult me.
97. Lately, I have been kind of grouchy.
98. I do not mind meeting strangers. (479)
99. I would rather concede a point than get into an argument about
    it.
100. I sometimes show my anger by banging on the table.
APPENDIX B

Description of the stimulus slides given in the order of presentation

The description is taken verbatim from the TAT manual. The letter following the number indicates whether the slide is an aggressive (A) or control (C) picture. The number in parentheses is its order in the TAT.

1. (C) (9EM) Four men in overalls are lying on the grass taking it easy.
2. (A) (3EM) On the floor against a couch is the huddled form of a boy with his head bowed on his right arm. Beside him on the floor is a revolver.
3. (C) (12BG) A rowboat is drawn up on the bank of a woodland stream. There are no human figures in the picture.
4. (A) (9GF) A young woman with a magazine and a purse in her hand looks from behind a tree at another young woman in a party dress running along a beach.
5. (A) (8EM) An adolescent boy looks straight out of the picture. The barrel of a rifle is visible at one side, and in the background is the dim scene of a surgical operation, like a reverie-image.
6. (C) (10) A young woman's head against a man's shoulder.
7. (C) (19) A weird picture of cloud formation overhanging snow-covered cabin in the country.
8. (A) (18EM) A man is clutched from behind by three hands. The figures of his antagonists are invisible.
9. (C) (13G) A little girl is climbing a winding flight of stairs.
10. (A) (13MF) A young man is standing with downcast head buried in his arm. Behind him is the figure of a woman lying in bed.
APPENDIX C

TAT hostility weighted score scale

4 Points: Themes involving direct physical hostile acts involving humans.

3 Points: Themes involving hate;
Themes involving thoughts, feelings, dreams or threats of direct physical hostile acts between people;
Themes involving punishment, permanent debilitating injury, and death;
Themes involving direct physical hostile acts involving animals.

2 Points: Themes involving verbal hostility;
Themes involving derogatory descriptions of people;
Themes involving anti-social acts;
Themes involving people forced by others to do things;
Themes involving hostile or negative emotionality;
Themes involving rejections;
Themes involving illness and accidents causing injury;
Themes involving destruction of inanimate objects;
Themes involving predatory animals;
Themes involving destructive forces of nature;
Themes involving weapons.

1 Point: Themes involving emotional deprivation;
Themes involving fear;
Themes involving guilt feelings;
Themes involving escape;
Themes involving misfortunes;
Themes involving death symbols;
Themes involving broken objects;
Themes involving the military;
Themes involving denial of aggression.

0 Point: Themes without hostile content.