

USE OF THE BODY BOUNDARY CONCEPT IN
PREDICTING RESPONSES TO STRESS

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CHAPTER I

INTRODUCTION

For years there has been an interest in the area of self-concept and how it affects a person's perception of his world. One tangent of this area is how one's attitude about his body affects his personality. Sheldon (1942) and Stevens (1942) attempted to demonstrate relationships between dimensions of the body and personality. Other researchers, Lacey (1950), Malmo and Shagass (1949), and Wenger (1947) take the point of view that the body could be equated with various measures of physiological measures and personality variables.

Although these researchers have attempted to develop theories in this area of body image and self-concept, Seymour Fisher and Sydney Cleveland have a unique approach to the study of "body image" and how it relates to personality types. Since their first text in 1958, entitled Body Image and Personality, there has been a tremendous increase of studies in this area. From their findings they have developed the idea that persons may be classified into two types of boundary definiteness: "Barrier" and "Penetration of Boundary." The instrument used for measuring these types is the Holtzman or Rorschach inkblots. A response which emphasizes the protective, decorative or containing qualities of the periphery of the percept is scored "Barrier". Responses that would be scored as barrier would include: "cocoon", "snail", "feet with fancy red socks", "man in armor" and "mummy wrapped up".

On the other hand, responses which emphasize boundary weakness or penetrability of the periphery of the percept are scored as "Penetration". Responses that would be scored as penetration include: "x-ray picture", "oil gusher coming in", "doorway", "window", and "torn coat". The total number of responses for each group constitutes the score. The Barrier index has been shown to be a highly reliable measure of body boundary definiteness which can be objectively determined and has adequate test-retest reliability (Fisher, 1963). It is positively correlated with achievement drive, need for task completion, ability to deal with stress, independence of judgment, ability to adjust to serious body disablement (Fisher, 1963; Fisher & Cleveland, 1958), group behavior (Cleveland & Morton, 1962; Ramer, 1963), modes of body experience (Fisher & Fisher, 1964), and also a variety of psychological and systematological measures (Fisher, 1963).

Several studies dealing with boundary concept have indicated that one of its functions is to modulate incoming stimuli, during the process of being received. In 1970, Fisher found that the apparent perceptual vividness of a variety of visual stimuli was positively linked with the barrier index. Twente (1964) observed that the barrier score was positively linked with degree of receptivity to sensory experience upon awakening in the morning. Wertheimer and Bachelis (1966) found that the ability to discern fine color was positively correlated with the barrier score.

In addition, evidence has emerged that the barrier score is positively linked with measures of activation of skin, muscle, and the peripheral circulatory systems (GSR and muscle potential). By contrast it is negatively correlated with indices of internal activation (heart

rate). Lacey (1959) and Obrist (1962) have provided evidence which supports this view. Their studies indicate that when an individual is mobilized to focus upon outer stimuli there is an accompanying increase in skin reactivity and a decrease in heart rate.

Based on the above findings, one might question the relationship between the barrier score and the responses of an individual while experiencing a stressful situation. Researchers have found evidence to support the notion that the possession of definite boundaries permitted the individual to deal relatively efficiently with stress. Studies found that the barrier score seemed not to be influenced either by the amount or chronicity of damage sustained by the body (Fisher & Cleveland, 1958; Ware, Fisher & Cleveland, 1957). There is particular evidence that reaction to the stress of body disablement was likely less severe in the definite than indefinite bounded individual (Landau, 1960).

McConnell and Datson (1961) found in their studies on stress of pregnant women that the barrier score did not change in pre-delivery and post-delivery testing. Thus, these studies supported earlier reports of the independence of the barrier score in relation to alterations in the body.

In summation, the barrier score has been shown to be not only a reliable measure but also a very stable one. It then seems appropriate to consider the predictive qualities of this measure. Brodie (1959) evaluated the barrier score as a predictor of response to stress situations (e.g., delayed auditory feedback). The responses were examined on the following dimensions: self-blame versus blame of others for failure, emotional expressivity, aggressiveness versus passivity, and tenacity in persevering at task goals. The barrier score proved to be

significantly linked with a number of the criteria measures, but the relationships were inconsistent.

Other researchers have found that stress causes certain changes in the structure and chemical composition of the body which can be accurately appraised (Seyle, 1976). Several lines of research have been followed such as: (1) behavior of people in disasters (Baker & Chapman, 1962); (2) mourning following bereavement (Lindemann, 1944); (3) various forms of psychopathology (Hambling, 1959); (4) the nature and effects of concentration camps (Bettleheim, 1960); (5) military combat (Grinker and Spiegel, 1945); and (6) patients anticipating surgery (Janis, 1958).

While natural occurring incidents provide examples of stress, a laboratory analogue has been devised by Lazarus (1962). In most experiments, the basic method of producing stress has been to show a motion picture, and to manipulate the orientation toward them by introducing statements and/or by sound tracks during film which casts events viewed in the way the experimenter chooses (Speismann, 1964). Typically the subject watches the film individually while a continuous recording is made of psychophysiological variables (e.g., skin conductance, heart rate, respiration and motor activity) and of the subject's affective state (usually by an interview or an adjectival check-list of mood).

Since stress has become more and more the life style of Western culture, it was thought that a study designed to show the predictability of the boundary concept might prove useful. The same basic procedure was followed in this study dealing with stress as mentioned earlier. A color film, entitled "Operative Obstetrics," was used. Although this is a sound film, the sound portion was eliminated in hopes that this would create a more stressful situation. A psychological measure of

general affect was taken using the Multiple Affect Adjective Checklist prior to showing the film. Subjects were divided into two groups-- High Boundary and High Penetration--as a result of their responses to the Holtzman Inkblots.

The second part of this study dealt with taking a physiological measure (heart rate) while viewing the film. Another measure of affect was taken immediately after the viewing of the film.

It was thought that the study would provide additional information on the subject of stress and, more specifically, provide an adequate test for the predictive qualities of the boundary index.

CHAPTER II

METHOD

Subjects

The study was originally composed of 30 male and 30 female college students drawn from the undergraduate population of Oklahoma State University. The 20 resulting subjects were those who had scored in the most extreme divergent directions on the Holtzman Inkblots test boundary measure. Ten subjects had barrier scores in excess of penetration, 10 subjects had penetration scores in excess of barrier. The former group was called High Barrier; the latter group was called High Penetration. The range of the Barrier-Penetration scores for High Barrier was +2 to +7, for High Penetration it was -2 to -4. These subjects were divided equally into four groups on the basis of their sex and their body definiteness index, yielding four cells of five subjects each.

Apparatus

In phase I of the experiment of the Holtzman Inkblots, Form B in slide form, blots 1 through 47 (including X and Y) were used. Previous tests of reliability, test-retest reliability, intra-scorer and inter-scorer reliabilities have been combined with correlations ranging from the upper .80's to .995. The Holtzman has been found to be a valid and reliable measure of personality and perception. For projecting the

slides, a carousel slide projector and viewing screen were employed. The Multiple Affect Adjective Checklist and response sheets were also used during this phase of the experiment. Both internal and test-retest reliabilities have been examined for the MAACL. Internal reliability coefficients have been reported to range from .65 to .92 while test-retest correlations of this state measure are low with a range of .15 to .84, with only occasional findings of significance and stability.

In phase II of the experiment, a physiograph machine (Model 6, developed by E and M Instrument Company) was used along with a six minute color film entitled "Operative Obstetrics." This particular film is used primarily as a training tool for doctors. It depicts a draped female being prepared for delivery. The entire preparatory process is shown. The subjects viewed the film while the surgeon makes an episiotomy to make the delivery of the baby easier. The film continues with the actual birth of the baby, the cutting of the naval cord, the expulsion of the afterbirth and the stitching of the incision.

The brief form of the Multiple Affect Adjective Checklist and response sheets were also used in this phase of the experiment.

Procedure

During the first phase of this experiment, 60 subjects were given the MAACL for a measure of general affect. Two measures were derived, anxiety and hostility. Thus, any change that may take place after viewing the film could be compared. It should be noted that the subjects were run in small groups of about five to ten due to conflicts in class schedules and available facilities. The experiment began with the subjects receiving a short briefing which included the instructions for

the MAACL (Appendix C) and the standard instructions for the Holtzman Inkblots (Appendix C), adapted to slide presentation. After the inkblot instructions, the following procedure was used: the Holtzman Inkblots were projected for 60 seconds and the subject responded to each inkblot on an answer sheet.

The second phase of the experiment consisted only of those subjects who had scored in the most extreme divergent directions of the boundary dimension. These 20 subjects were individually wired to a physiograph. Electrodes were placed on the right ankle and both wrists of the subject. The subject was told:

During this phase of the experiment, I am interested in recording your heart rate. This machine is called a physiograph. I am going to place electrodes on both your wrists and on your right ankle. This cream is a conductor for the current. Please sit back and relax, try not to move your arms or feet because this will affect the readout from the machine.

Any questions the subject had were answered at this time. A base rate was taken for five minutes while the subject was wired to the physiograph. At the end of this period, the subject was told: "You are about to view a film and I would like for you to observe it closely. If at any time you wish to stop the film, you may do so by saying 'stop'."

Design

The statistical method used was a three-way ANOVA on three separate dependent variables. The independent variable in the ANOVAs were Group (Barrier and Penetration), Sex (Male and Female), and Time (Pre and Post). The dependent variables were MAACL Anxiety and MAACL Hostility and "incision" heart rate.

The heart rate measures were based on the average mean inter-beat

Interval (IBI) for the 10 beats prior to the viewed stressor (incision) and 10 beats following the incision.

CHAPTER III

HYPOTHESES

The following hypotheses were tested:

1. Barrier male subjects will have a significantly lower reactive heart rate than the Barrier females.
2. Barrier males' reactive heart rate will be significantly lower among all groups.
3. Penetration females will have significantly higher reactive heart rates compared to all other groups.
4. Penetration females would be significantly higher in anxiety, hostility and reactive heart rate than Penetration males.

CHAPTER IV

RESULTS

The results of this study did generally support the findings of Lacey (1959) and Obrist (1962). For the High Barrier group, the mean of the Barrier responses was 3.9 (S.D. = 2.46), while the mean of the Penetration responses was 0.6 (S.D. = 0.49). For the High Penetration group, the mean of the Barrier responses was 2.7 (S.D. = 1.19), while the mean of the Penetration responses was 2.8 (S.D. = 1.08).

Two t-tests were used to compare the two group scores on each measure. For Barrier, the two groups were significantly different, $t(18 \text{ df}) = 1.77, p < .05$ (one tail). For Penetration, the two groups were significantly different, $t(18 \text{ df}) = 7.46, p < .0001$ (one tail). Figure 1 compares the heart rate of the Barrier subjects to the Penetration subjects.

The three way ANOVA on incision heart rate showed a significant main Sex effect, $F(1,16) = 6.08, p < .05$, and a marginally significant Group x Sex interaction $F(1,16) = 4.05, p < .08$. The main Sex effect was based on the males with a significantly slower heart rate ($\bar{x}=68$ bpm) than the females ($\bar{x}=86$ bpm) across both time periods. The Group x Sex interaction was further investigated by the use of the Newman-Keuls method of planned comparisons. The results of these comparisons showed that only Penetration males and Penetration females were significantly

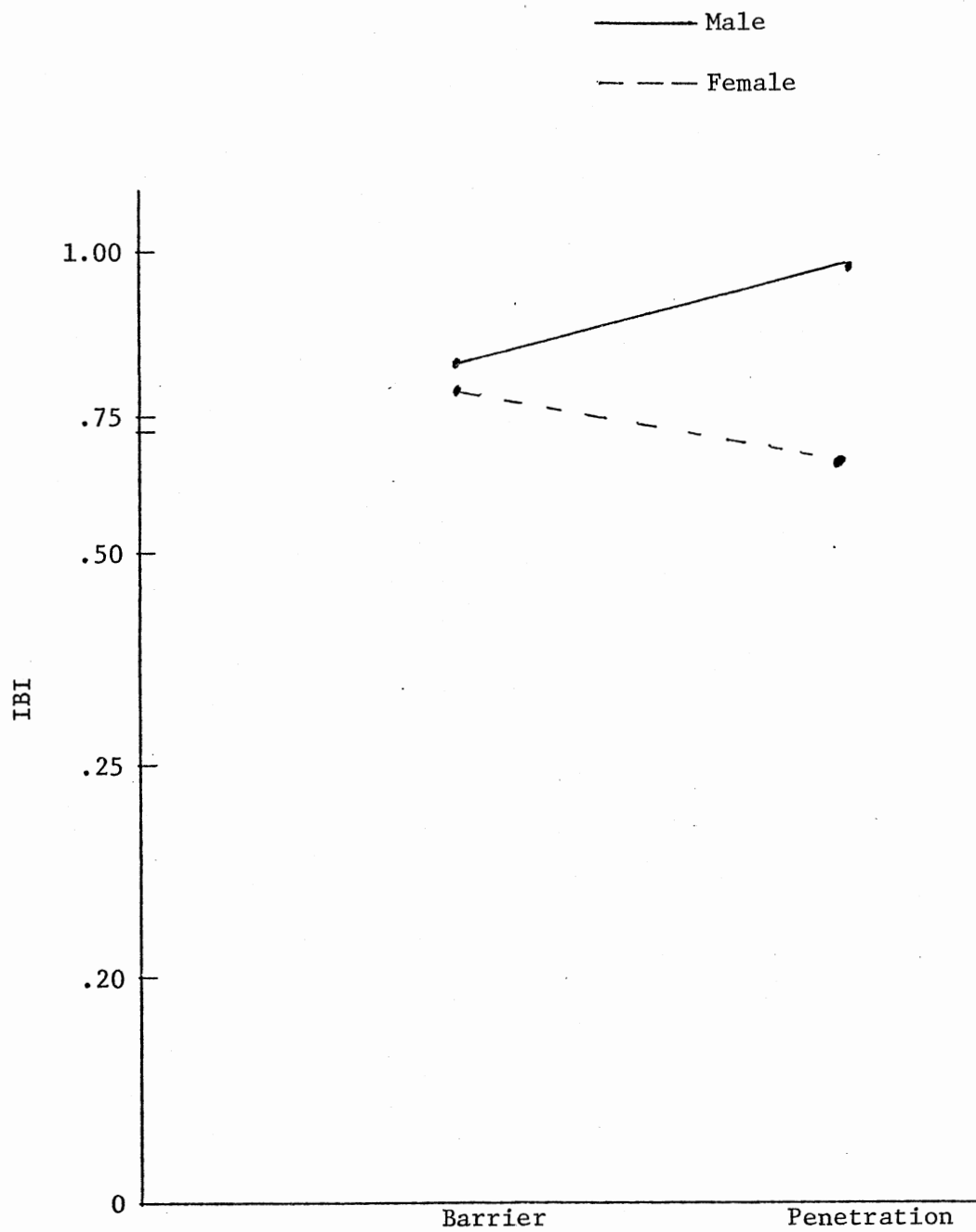


Figure 1. Group by Sex Interaction on Incision Heart Rate (Interbeat Interval)

different from each other ($t = 0.337, p < .05$). Figure 1 depicts this interaction.

The three way ANOVA on the MAACL Anxiety showed a significant main Time effect, $F(1,16) = 13.0252, p < .005$, and a marginally significant Sex x Time interaction, $F(1,16) = 3.26, p < .10$. The main Time effect showed a strong increase in reported anxiety for before the film to after viewing the stressor (Pre, $\bar{x} = 0.85$; Post, $\bar{x} = 2.65$). The Sex x Time interaction was due to the females' greater increase in anxiety over the males' increment, following the viewing of the film, $t(1,18) = 2.65, p < .02$, for a two tail test. Figure 2 depicts this interaction.

The three way ANOVA on MAACL Hostility showed a significant main Time effect, $F(1,16) = 9.44, p < .01$; and a marginally significant Sex effect, $F(1,16) = 3.73, p < .08$. No other main or interaction effects were significant.

The main Time effect showed a marked increase in reported hostility (Pre, $\bar{x} = 5.85$; Post, $\bar{x} = 7.70$). The main Sex effect was based on the males having a higher degree of reported hostility ($\bar{x} = 7.55$) than females ($\bar{x} = 0.60$) across both sessions.

In summary, there was a general increase in affect while heart rate remained relatively stable. Sex of the subject did effect the affect state. The Boundary variable did not discriminate differences in heart rate. However, within the High Penetration group, the sex of the subject did predict to differences in heart rate. Penetration males showed a slower heart rate while viewing the obstetrics film than Penetration females.

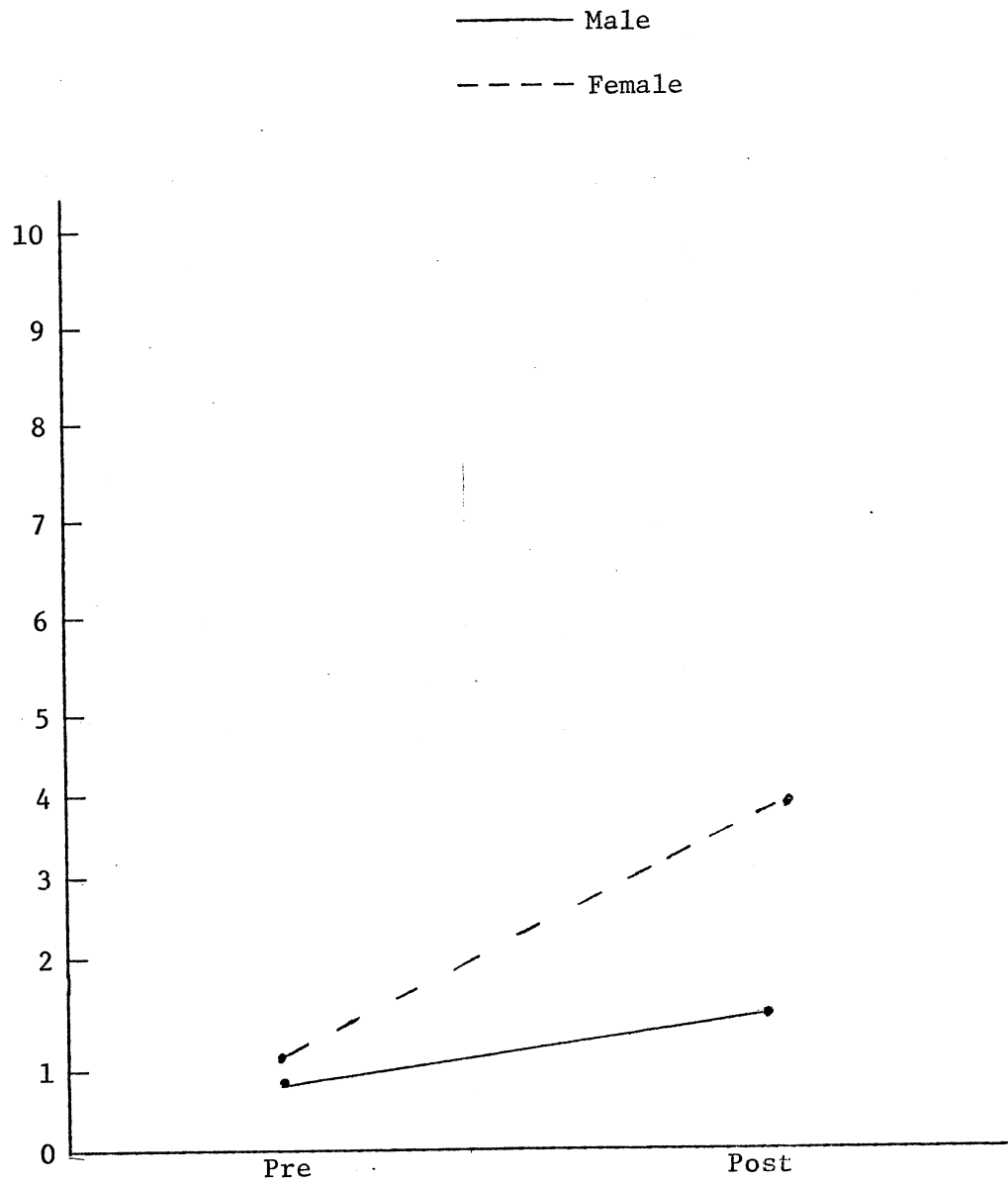


Figure 2. Sex x Time Interaction on Anxiety

CHAPTER V

DISCUSSION

The purpose of this study was to investigate the use of the boundary concept as a predictor of stress. This predictive quality was achieved with moderate success in that individuals with low Barrier scores did not show marked heart rate increases which had been demonstrated elsewhere (Fisher, 1968; Datson & McConnell, 1961).

It was hypothesized that the Barrier male subjects would have a significantly lower reactive heart rate than the Barrier females. This study tended to generally support this view with the Barrier females showing a significant increase ($p < .05$) over the Barrier males. Since all Barrier subjects would be expected to have lower heart reactivity, some other factor must be operating to account for the apparent sex-related findings among the Barrier subjects. Perhaps these results can be explained by investigating the subject matter of the film. It can be concluded that the female subjects were more ego-involved in the stressful task of viewing the film on childbirth.

Secondly, it was hypothesized that the Barrier males' reactive heart rate would be significantly lower among all groups. There was no support for this hypothesis, in regard to the incision heart rate.

Third, it was hypothesized that Penetration females would have significantly higher reactive heart rates among all other groups. This

did not hold true; however, Penetration females did show a significantly higher heart rate than the Penetration males.

Finally, it was hypothesized that Penetration females would be significantly higher in the affect states of anxiety and hostility than the Penetration males. In comparing male and female subjects without regard to their body boundary classification, there was a significant increase in the affect states of hostility and anxiety of the female subjects. These results would indicate that as a group the female subjects' psychological reactivity increased while the male subjects experienced little or no increase.

The results are generally in line with previous research which indicates that among adults there was no relationship between Barrier scores and degree of masculinity-femininity, per se, that had been established. Further, adult men and women from middle-class American society do not differ on the Barrier score (Fisher, 1958). If this is true, then how does Fisher account for the differences shown in this study between male and female subjects in both High Barrier and Low Barrier groups? According to Fisher's hypotheses, whenever sex differences do occur in Barrier scores, it represents differences in degree of confusion over life and self identity.

In other studies where stress decrement is associated with apparent personality instability, it gives one type of result; and where decrement may be presumed to be a function of not being easily threatened, it gives quite an opposite result. The results of two such studies are now presented.

The first study conducted by Westrope (1953) used two groups of subjects; high anxiety (low Barrier) and low anxiety (high Barrier).

Subjects were scored on how many of the Digit Symbols they recorded correctly. An average decrement score on the Digit Symbol test taken under stress was determined for each individual by subtracting his average score on the three Digit Symbol stress trials from his average score on the last three training trials (control period). Thus, in this study stress was seen as a function of a decrease in the number of errors made during the stress trials. Subjects who scored low (high Barrier) on this test were considered less affected by stress than those subjects who scored high (low Barrier). These findings support Fisher's hypothesis.

On the other hand, the second study conducted by Carlson and Lazarus (1953), demonstrated that when stress is viewed as a function of not being easily threatened, the results showed that subjects who were more neurotic (low Barrier) showed low decrement. That is, subjects showing greater anxiety or neuroticism (low Barrier) on the Winne Neuroticism Scale tended to show more improvement. The reversal in relationship of the Barrier score to stress decrement in the Carlson-Lazarus data as compared to the Westrope data suggests that the Barrier score is a versatile complex indicator of reaction to stress.

In conclusion, the purpose of this study was to evaluate the use of Fisher's body-boundary concept as a predictor of stress. In general, this study has shown that the body-boundary concept is only moderately successful in its predictive quality. The data shows that the Barrier group did not significantly differ from the Penetration group on reactive heart rate. However, of particular note is the significant increase of reactive heart rate among Barrier females. This sex-related finding is of particular importance due to the contradictory research (Fisher,

1958) which demonstrates that there is no difference between Barrier males and females.

In regard to the affect states of anxiety and hostility, there was no significance between Barrier and Penetration subjects. However, there was a significant increase in anxiety and hostility for the female subjects.

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APPENDIXES

APPENDIX A

LITERATURE REVIEW

Body Image, Boundary and
Barrier Response

One construct that has been tested through use of the Holtzman Ink-blot technique is that of body-image and body-boundaries.

Fisher and Cleveland (1958) devised a system for scoring the Rorschach in a manner they feel sheds light on the individual's body-image. This technique was later adapted for use with the Holtzman Ink-blots. The system attempts to describe the body boundaries according to whether they are firm and "substantial" or, on the other hand, "weak and easily penetrable."

Initially, Fisher and Cleveland conducted a study of personality of patients with rheumatoid arthritis (Fisher & Cleveland, 1955). They noticed that the patients made an unusual number of unique Rorschach responses that possessed enclosing qualities of the percept. Based upon these observations, Fisher and Cleveland developed a scoring system for the "Barrier" quality of the Rorschach responses.

The theoretical system sees an individual's body image as being a reflection of the type of object relations he has been able to establish. That is, people with high Barrier scores are seen as having formed substantial images of their own bodies as being capable of dealing with others from this locus of a firm, well-integrated self-image. High Barrier scorers are able to deal with people and situations in a commanding, well-integrated, effective manner (Cleveland & Morton, 1962; Frede, Gautney, & Baxter, 1968; Ramer, 1963). Those individuals with lowered Barrier scores are seen as having penetrable, uniform body images, and therefore deal with others from this weakened homebase.

Physiological patterns were among the first correlates of boundary definiteness to be observed. The Barrier percept has been viewed as referring to the exterior or body wall, and since it includes a number of explicit and implicit attitudes, it is not seen as being consistently related to any physical characteristics of the individual. It is relatively stable after it has become developed and is not easily changeable despite changes in physical appearance of the individual (Ware, Fisher, & Cleveland, 1957; Fisher, 1959).

In the area of personality development, the barrier concept has been viewed as a reflection of significant developmental experiences. Thus, although the concept arose from the study of psychosomatic individuals and physically ill patients (Fisher & Cleveland, 1960; Shipman et al., 1964), a number of studies have concerned body images of the subjects directly (Fisher & Fisher, 1964; Fisher & Mirin, 1966; Rogers & Walsh, 1959). The later developments in theorizing have served to take the "body" out of body image; at some points, it is difficult to distinguish between body boundaries and ego boundaries, or between body-image and self-concept (Fisher & Cleveland, 1958).

Physiological reactivity played a role in studies dealing with the barrier concept. Fisher and Cleveland (1957) hypothesized that individuals with clear and definite body-image boundaries are predominately reactive to the outer body layers and less reactive within the body interiors; on the other hand, those individuals who are characterized by more weak and indefinite boundaries exhibit the converse pattern. The body exterior in this theory includes the skin, striate musculature, and the vascular components of these two systems; the body interior includes all of the interior viscera. It is thought that individuals who

have firm and definite body-image boundaries are capable of responding voluntarily and mastering a situation, whereas those of more indefinite boundaries are more passive recipients of stimulation, with their predominate response being involuntary and interior. Several studies have been conducted that have largely confirmed this particular hypothesis, and there has also been a number of studies with a variety of psychosomatic patients which have stemmed from the hypothesis that excitation is centered in the body exterior for the person with firm body boundaries and in the body interior for persons with weak body boundaries (Fisher & Cleveland, 1958; Fisher, 1970).

Since this paper deals with stress, it would be of interest to examine the Barrier concept as it relates to stress. The model used in describing the high Barrier individual suggests that he would have particularly good facility for maintaining his equilibrium in the midst of stress. His well-defined boundaries provide him with protection and a base of operations, as it were. The low Barrier person would, on the contrary, be expected to be vulnerable to stress and to find it difficult to maintain his own course through the complications and confusion associated with the stress. It would follow, then, that high Barrier people should show better performance on stress tasks than low Barrier people.

There has been an attempt to evaluate the meaningfulness of boundary approach to physiological reactivity by the analysis of heart rate under stress. Theoretically, it was hypothesized in terms of boundary concepts that those persons with definite boundaries would show relatively less heart response (interior) to stress than would persons with indefinite boundaries. In 1956, Herring conducted a study in which he

observed the relationship of an individual's personality characteristics, as measured by the Rorschach, to his physiological response while under the influence of anesthesia in the course of major surgery. Maximum heart measures during the stress of surgery and minimum heart measures as well as barrier scores were kept on the subjects. The boundary hypothesis would require that high Barrier scores be associated with low maximum and also low minimum rates and that low Barrier scores be associated with high maximum and high minimum rates. That is, definiteness of boundaries should be accompanied by relatively little heart responsivity and the converse would be true of individuals with indefinite boundaries. This study seems to corroborate the body-exterior versus body-interior approach to physiological reactivity (Fisher & Cleveland, 1958).

Holtzman and Bitterman (1956) collected data by means of the Sam Pseudoscope, which is basically a mirror-drawing task. It requires that the subject trace a pattern under conditions of 180 degrees rotation of the visual field. It is administered with instructions to achieve maximum accuracy and speed. Its stressful aspects are maximum by exposing subjects to flashing red illuminations and vibrations of the tracing surface while they are attempting to trace the pattern. Performance is evaluated in terms of two scores. One reflects accuracy (total time spent in making errors) and the other reflects speed (total time to complete tracing). The Pseudoscope behavior of the subjects above and below the Barrier median was compared by use of nonparametric Median test. This comparison was made in terms of total time and also in terms of error time. The above- and below-median Barrier subjects did not differ at all so far as the total time measure was

concerned. The error time score, however, differentiated the two groups in the predicted direction at better than the .01 level ($X^2 = 7.4$). The high Barrier subjects were quite obviously superior to the low Barrier subjects in their ability to handle stressful situations. Other tasks were also investigated for stress reactions, these included: hand steadiness aspiration task and digit symbol decrement. The results of these investigations have generally supported the above findings.

The Holtzman Inkblot Technique

The present study makes use of the Holtzman Inkblot Techniques as a measurement. A brief description of the evolution and use of this technique will be presented.

On the University of Texas campus in 1954 there began a concentrated effort to develop a new inkblot technique. The purpose of this new technique would be to overcome the limitations of the Rorschach by increasing the number of inkblots and by developing parallel forms. A professional artist helped to construct thousands of inkblots varying in symmetry, color, shading and form. Experimental test forms were assembled and standardized responses to 135 of the more promising blots were obtained from two populations of undergraduate college students and patients in a state mental health hospital. The subjects were asked to look at each inkblot and tell what it might look like, what it might represent, or what it could be. Unlike the Rorschach, the subjects were allowed to make more than one response; however, the instructions encouraged one so that the variation could be kept to a minimum.

The final forms of the Holtzman Inkblot Technique were constructed by taking the best inkblots and arranging them in two sets containing

45 blots. The resulting Form A and Form B are strikingly similar, assuring their interchangeability as parallel forms of the same test.

The scoring system of the Holtzman includes 22 different variables that cover many aspects of the individual's response to an inkblot. Systems for scoring the Rorschach were carefully taken into consideration in defining these variables so that most Rorschach scores could be easily derived from the basic elements in these 22 variables. Several criteria played a prominent role in formulation of variables for the scoring system. First, a variable had to be one which could be scored for any legitimate response, making it at least theoretically possible for a score to range from 0 to 45 when given unitary weight. Second, the variable had to be sufficiently objective to permit high scoring agreement among trained individuals. Third, the variable had to show some a priori promise of being pertinent to the study of personality through perception. Fourth, each variable had to be logically independent of the others wherever possible in order to code the maximum amount of information in the most flexible, efficient manner. The 22 variables are summarized in Appendix D.

Various types of reliability studies have been completed on the Holtzman. The range of the intra-scorer consistency is from .89 to .97. The highest intra-scorer consistency occurred for color with a value of .97 and the lowest intra-scorer consistency occurred for penetration with a value of .89. Individuals who are highly trained generally show a very high degree of self-consistency in their scoring, usually varying between the high 80's to .98.

Inter-scorer reliability for Rejection and Reaction Time was not determined because of the obviously high agreement one would get between

two scorers in counting the number of rejected cards or transcribing the recorded time. Space, Sex, Abstract, and Affect Arousal had such badly skewed distributions due to infrequent occurrence that reliability coefficients were not computed. Agreement was quite high when non-zero scores were assigned. The inter-scorer consistency for the remaining 15 variables was generally very high, ranging from .89 to .995, with a median value of .98.

The internal consistency of a score is reflected by the use of the split-half method. Split-half reliability revealed that the internal consistency of the subject's response was high for most variables with the exception of anatomy, space, abstract and balance which were shown to be truncated or skewed in their distribution. The results of test-retest studies show that over a year's time, stability remained stable for Reaction Time, Form Definiteness, Color, Movement, and Human. There was comparable, but lower, correlations for Animal, Anxiety, Barrier, and Penetration.

Multiple Affect Adjective Checklist

In the field of psychology there has been an interest in the affect states and their relationship to behavior. Ways to measure these affect states have been developed in the form of checklists and questionnaires.

Affect may be defined as the psychological aspect of emotion, or the emotional response which is assessed by means of verbal reports. The study of affect has been intensely studied along physiological dimensions. The psychological measure of affect has been generally viewed as a trait rather than a state. The entire area of measuring

affect has suffered from poorly standardized and ad hoc self-rating scales.

In 1960, Zuckermann and Lubin developed the Multiple Affect Adjective Checklist. The items were collected from Gough's and Nowlis' lists and a thesarus. Adjectives with a low frequency in the written language were excluded so that subjects of less than average intelligence could understand the items. The final list of adjectives consisted of 61 items. Normative data was collected on several populations: job applicants, college students, patients in veterans' hospitals, psychiatric patients and clinical samples.

The purpose of the MAACL was to measure day-to-day changes in three affects: anxiety, depression, and hostility. There is some evidence which indicates that the scales of the MAACL are bipolar (measuring positive and negative affects), and that low scores on the full scales will indicate states of positive affect. Positive words may be measuring something other than negative words where lack of response indicates the affect. Despite this, the test-retest reliability of the total Hostility scale as well as the reliability of the total Anxiety scale and Depression scales were high and significant. The actual correlations between the General and Today forms of the MAACL Anxiety scale in a psychiatric sample ($r = .52$) were only slightly higher than those found in a college population ($r = .43$).

The brief form of the MAACL was due to the high inter-correlations between the full scales and the desire to develop a shorter and more independent scale for anxiety, depression, and hostility. An item analysis was conducted on 200 "normals" and 278 patients. Each item in the MAACL was correlated with each of the three full scale anxiety,

depression, and hostility scores using biserial correlations. Only those items that correlated with their own scale, relative to their correlations with the other two scales, were selected for use in the brief scales. A total of 10 anxiety items, 24 depression items, and 14 hostility items met these criteria. The resultant items formed what is called the "brief form" of the MAACL and appears in Appendix .

The procedure for scoring the brief form is the same as for scoring the full scale of the MAACL. The research indicates that as in the full scale the Hostility scales show no validity in terms of their correlations with affect ratings or questionnaires.

The "brief form" of the MAACL has been found to be a reliable measure on test-retest reliability. The Hostility scale was found to have a higher reliability in the shorter form than in the full scale. However, the scale is rather insensitive to small differences in groups of normals.

The administration of the test requires about five minutes. Standard instructions are provided. The administrator may be flexible in the time set used to suit his purposes. For example, "how do you feel now" as opposed to using "how do you generally feel." Scoring of the checklist is generally done using a key. The score is obtained by counting the number of plus (+) items checked and the number of zero (-) items not checked for each affect.

In various studies, Zuckermann, Libermann, and others have indicated that the MAACL is a valid test which is sensitive to the affect states of the individuals (Zuckermann, 1960; Winter et al., 1963; Libermann, 1965). The MAACL is positively correlated between hostility and affect states is not significant. Clinical observations do not bear

out the above findings. The self-ratings were low in reliability possibly due to the denial of the patients using the measuring tool. A variety of areas has been explored to test the validity of the MAACL; examination anxiety, hypnotically induced anxiety, perceptual isolation, stage fright, changes induced by pictorial stimuli, clinical observations, drug studies, and correlations with various personality tests.

Both internal and test-retest reliabilities were conducted. Internal reliability coefficients were significant ranging from .65 to .92; while test-retest correlations are low, ranging from .15 to .84 and only occasionally of moderate significance. However, Tolor and Mabli (1965) found in their study using psychiatric patients that the internal reliability coefficient of the hostility scale was not significant and the anxiety and depression scales, plus and minus items were not correlated in the fifth study using psychiatric patients. In part this may be due to the fact that plus items and minus items were correlated instead of odd and even items.

Stress

The subject of stress is of such magnitude that it could not be adequately discussed in this paper. The review will be a general overview of the area with brief highlights of some research techniques.

Today's Western society has become increasingly stressful. There are literally volumes of research and writing on the subject including the overlapping areas of conflict, frustration, anxiety, fear, and disaster. The reason for such an abundance of interest is that "stress, as a universal human and animal phenomenon, results in intense and

distressing experience and appears to be of tremendous influence on behavior" (Lazarus, 1966).

What is stress? The answer to this question is as varied as the phenomenon itself. Not only is the terminology used to describe stress inconsistent and confusing, but definitions of stress are contradictory. The distinction is only occasionally made between psychologically based stress and those produced by direct assault by noxious stimuli on bodily tissues. Fisher and Cleveland (1958) have defined stress as being produced by such varying conditions as a painful electric shock, hostile criticism, failure at assigned task, and deprivation of sleep.

In addition to the problem of definition, there is a lack of a unifying system of concepts dealing with the mechanism of stress, a system that could be universally used to generate theories. The majority of the literature on stress leaves no foundation on which researchers can build (Appley & Trumbull, 1967). Grinker and Spiegel (1945) implied that stress causes a disequilibrium in the system which produces a dynamic kind of strain; that is, changes in the system against which mechanisms of equilibrium are activated. This view lends itself to Selye's (1956) adaptation syndrome, a complex series of neural-hormonal reactions against affects of noxious stimulus agents on the tissue system. Other considerations that must be dealt with in studying stress are: (1) cultural differences, (2) the developmental stage of the individual, and (3) species differences.

There is a general consensus that in dealing with stress certain cognitive processes mediate between the stimulus and the reaction. The key intervening variable is threat. This means that threat does not refer directly to observable factors but must be inferred from antecedent

conditions and responses. Its main characteristics are twofold: (1) it is anticipatory or future oriented, and (2) it is brought about by cognitive processes involving learning, perception, judgment, thought, and memory. It is commonly believed that threat is subjectively worse than actual confrontation, and that individuals will endeavor to minimize the period of uncertainty or indecision about the anticipated event before the confrontation. The experimental literature contains many examples of research in which the purely psychological, anticipatory aspects of stress have been isolated and studied as the antecedents of threat and physiological stress reactions. In a study by Shannon and Isbell (1963), physical pain, tissue damage, and use of anesthetic drugs did not produce measurable physiological-stress reactions beyond those produced by the mere anticipation of such conditions. Threat differs both in quality and quantity. The qualitative aspect has to do with the nature of the harm that is anticipated. The quantitative aspects of threat hinge on the kind of stimulus agent that will produce the harm--for example, economic depression, physical aggression, social or physical barriers, etc. These stimulus agents also connote the type of harm that they will produce. Therefore, in speaking about the quality of threat, there is a tendency to emphasize the nature of the harm that is anticipated as well as the harmful stimulus agent. Threat also varies in degree. The degree of threat is a function primarily of amount, imminence, and likelihood of the anticipated harm.

For threat to occur, an evaluation must be made of the situation, to the effect that a harm is signified. The individual's knowledge and beliefs contribute to this. The appraisal of threat is not a simple perception of the elements of the situation, but a judgment, an

inference in which the data are assimilated to a constellation of ideas and expectations (Lazarus, 1966). The mechanism by which the interplay between the properties of the individual and those of the situation can be understood is the cognitive process of appraisal, a judgment about the meaning of future significance of a situation based not on the stimulus, but on the psychological make up. In general, researchers have determined that there are three factors within the psychological structure that determine the appraisal of threat. These factors operate essentially as dispositions to evaluate cues in particular ways. They are: (1) motivational characteristics, (2) belief systems concerning transactions with environment, and (3) intellectual resources, education, and sophistication.

Recognizing that stress involves both psychological and physiological variables, Lazarus and others attempted to study this phenomenon. In 1962, Lazarus et al. used films as part of their research in studying the concept of appraisal. It had been found earlier that watching a silent film dealing with crude puberty rites, produced marked threat reactions. These reactions produced psychological responses such as: elevated skin conductance and increased heart rate; it also produced a psychological response as reported by subjects of disturbed affect.

It is this general paradigm of Lazarus and others that is used in the present paper.

APPENDIX B

MULTIPLE AFFECT ADJECTIVE CHECKLIST

The following adjectives are from the MAACL Full Scale and were used in the present study:

afraid_____	mad_____
agreeable_____	nervous_____
angry_____	polite_____
calm_____	shaky_____
cooperative_____	sympathetic_____
cruel_____	tender_____
devoted_____	tense_____
disagreeable_____	understanding_____
fearful_____	upset_____
frightened_____	warm_____
kindly_____	worrying_____

APPENDIX C

INSTRUCTIONS

Holtzman Inkblot Instructions

I am going to show you a set of inkblots. I would like you to look at each inkblot and write down what it might look like, what it might represent, or what it could be. Since these are only inkblots, there are no right or wrong answers and each blot looks like different things to different people. It is possible for a person to see several things in each inkblot, but I want you to give one response per slide. Write down what you see on the sheet provided. You will be given one minute to write down your responses and remember I want only one response per slide.

Multiple Affect Adjective Checklist

Instructions

The following are instructions for the Multiple Affect Adjective Checklist: Pre-film and Post-film.

Pre-Film Instructions

I am going to pass out the Multiple Affect Adjective Checklist. I would like for you to place an "x" by those words that describe how you feel now.

Post-Film Instructions

I am going to pass out the Multiple Affect Adjective Checklist. I would like for you to place an "x" by those words that describe how you feel after having viewed the film.

APPENDIX D

TABLES

TABLE I
ANALYSIS OF VARIANCE OF INCISION

Source	Mean Square	df	F	p Value
Sex	.3439	1	6.08	.05
Group	.004256	1	.0753	ns
Time (Pre and Post)	.0003709	1	.4010	ns
Sex x Group	.2292	1	4.054	.08
Sex x Time	.0002096	1	.2267	ns
Group x Time	.0002089	1	.2260	ns
Subject (Sex x Group)	.05655	16	----	
Sex (Group x Time)	.002094	1	.2265	ns
Subject x Time (Sex x Group)	.009248	16	----	
<u>Planned Comparisons:</u>				
Penetration Male vs. Barrier Female:	t = 1.65			ns
Penetration Male vs. Penetration Female:	t = .337*			
Barrier Male vs. Penetration Female:	t = .206			
Barrier Male vs. Barrier Female:	t = .034			ns

*p < .05.

TABLE II
ANALYSIS OF VARIANCE OF ANXIETY

Source	Mean Square	df	F	p Value
Sex	10.0	1	1.7582	ns
Group	.90	1	.1582	ns
Time (Pre and Post)	32.40	1	13.0252	< .005
Sex x Group	3.60	1	.6830	ns
Sex x Time	8.10	1	3.2563	< .10
Group x Time	1.60	1	.6432	ns
Subject (Sex x Group)	5.69	16	----	
Sex (Group x Time)	.00999	1	.0402	ns
Subject x Time (Sex x Group)	2.49	16	----	

TABLE III
ANALYSIS OF VARIANCE OF HOSTILITY

Source	Mean Square	df	F	p Value
Sex	24.025	1	3.7248	.10
Group	.625	1	.0969	ns
Time (Pre and Post)	34.22	1	9.4414	ns
Sex x Group	15.625	1	2.4225	ns
Sex x Time	3.025	1	.8345	ns
Group x Time	7.225	1	1.993	ns
Subject (Sex x Group)	6.45	16	----	
Sex (Group x Time)	9.02145	1	2.4897	ns
Subject x Time (Sex x Group)	3.625	16	----	

APPENDIX E

HOLTZMAN SCORING SYSTEM

The name, abbreviation, brief definition, and scoring for each of the 22 variables of the Holtzman Inkblot Technique are given below.

Reaction Time (RT). The time, in seconds, from the presentation of the inkblot to the beginning of the primary response.

Rejection (R). Score 1 when S returns inkblot to E without giving scorable response; otherwise, score 0.

Location (L). Tendency to break down blot into smaller fragments. Score 0 for use of whole blot, 1 for large area, and 2 for smaller area.

Space (S). Score 1 for true figure-ground reversals; otherwise score 0.

Form Definiteness (FD). The definiteness of the form of the concept reported, regardless of the goodness of fit to the inkblot. A five-point scale with 0 for very vague to 4 for highly specific.

Form Appropriateness (FA). The goodness of fit of the form of the percept to the form of the inkblot. Score 0 for poor, 1 for fair, and 2 for good.

Color (C). The apparent primacy of color as a response-determinant. Score 0 for no use of color, 1 for use secondary to form, 2 when used as primary determinant but some form present, and 3 when used as a primary determinant with no form present.

Shading (Sh). The apparent primacy of shading as a response-determinant. Score 0 for no use of shading, 1 when used in secondary manner, and 2 when used as primary determinant with little or no form present.

Movement (M). The energy level of movement or potential movement ascribed to the percept, regardless of content. Score 0 for none, 1 for

static potential, 2 for casual, 3 for dynamic and 4 for violent movement.

Pathognomic Verbalization (V). Degree of autistic, bizarre thinking evident in the response as rated on a five-point scale.

Integration (I). Score 1 for the organization of two or more adequately perceived blot elements into a larger whole; otherwise, score 0.

Human (H). Degree of human quality in the content of the response. Score 0 for none; 1 for parts of human, distortions, cartoons; and 2 for whole human beings or elaborated human faces.

Anatomy (At). Degree of "gutlike" quality in the content. Score 0 for none; 1 for bones, x-rays, or medical drawings; and 2 for visceral and crude anatomy.

Sex (Sx). Degree of sexual quality in the content. Score 0 for no sexual reference, 1 for socially accepted sexual activity or expressions (buttocks, bust, kissing), and 2 for blatant sexual content (penis, vagina).

Abstract (ab). Degree of abstract quality in the content. Score 0 for none, 1 for abstract elements along with other elements having form, and 2 for purely abstract content (bright colors remind me of gaiety).

Anxiety (Ax). Signs of anxiety in the fantasy content as indicated by emotions and attitudes, expressive behavior, symbolism, or cultural stereotypes of fear. Score 0 for none, 1 for questionable or indirect signs, and 2 for overt or clearcut evidence.

Hostility (Hs). Signs of hostility in the fantasy content. Scored on a four-point scale ranging from 0 for none to 3 for direct, violent, interpersonal destruction.

Barrier (Br). Score 1 for reference to any protective covering, membrane, shell, or skin that might be symbolically related to the perception of body-image boundaries.

Penetration (Pn). Score 1 for concepts which might be symbolic of an individual's feeling that his body exterior is of little protective value and can be easily penetrated.

Balance (B). Score 1 for instances where there is overt concern for the symmetry-asymmetry feature of the inkblot; otherwise score 0.

Popular (P). Each form contains 25 inkblots in which one or more popular percepts occur. To be classified as popular in the standardization studies, a percept had to occur at least 14 percent of the time among normal subjects. Score 1 for popular core concepts as listed in the scoring manual; otherwise score 0.

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VITA

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