A STUDY OF THE RELATIONSHIPS BETWEEN SELECTED RORSCHACH VARIABLES AND NEUROTICISM AND EXTRAVERSION

by Gloria L. Fellers

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CURRICULUM STUDIORUM

Gloria Leone Fellers was born July 8, 1930, in Bowling Green, Ohio. She received a Bachelor of Arts degree from Bowling Green State University, Bowling Green, Ohio, in 1952. She received a Master of Arts degree in Psychology from Bowling Green State University in 1953. The title of her thesis was A Response-Category Analysis of Wechsler-Bellevue Intelligence Scale, Form I, Vocabulary Responses.

ERRATA

Page	Line	
2	27	Footnote 5. Underline "Behn-Rorschach"
3	8	Delete "Rorschach" from "Behn-Rorschach"
8	26	Change "level" to "levels"
9	14	Delete comma after "Rorschach,"
10	10	Change "then" to "than"
16	26	Footnote 3. Change "455 p." to "p. 455"
18	11	Underline "Hi N-Hi E"
18	20	Place a comma after "Hi",
22	26	Footnote 11. Delete et. al.
23	17	Underline "Rorschach"
23	24	Footnote 12. Change "322 p." to "p. 322"
27	1	Change "Variable" to Variables"
36	2	Delete comma after "subjects,"
43	4	Change "stregthen" to "strengthen"
71	3	Change "VARIABLE" to "VARIABLES"

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INTRODUCTION

This investigation lies within the broad area of the study of personality variables. The statement that different people react differently under stressful conditions has been as difficult to establish as scientific fact, on the one hand, as it is widely accepted on the other. Efforts to verify this assumption experimentally, whether with individuals or groups of individuals, have most often yielded conflicting or at best inconsistent results. Some of these inconsistencies might be attributed to three distinct but related problems common to most research done in the area of applied clinical psychology.

One problem has to do with the isolation of psychological variables within individuals or groups of individuals. In recent years, a great deal of interest has focused upon the use of factor analytically derived measures as methods for isolating psychological and personality variables. Cattell and Guilford in North America, and Eysenck in Europe have conducted extensive research along these lines. In the experiment detailed in this thesis, an inventory developed by Eysenck for the purpose of identifying individuals on the basis of neuroticism and extraversion was used for the selection of subjects.

Another problem relates to the method of inducement of stress in an experimental, hence in the clinician's view

artificial, situation. The distinction between physiological and psychological stress has led to the development of satisfactory techniques for inducing self-esteem stress.

Thirdly, assuming the variables have been isolated and a satisfactory method found for inducing stress, a technique or instrument which would provide reliable cross-validation of the isolated variables, and at the same time be sufficiently sensitive to distinguish changes due to the induced stress in necessary. Recent research with the Rorschach has supported the contention that the technique differentiated between subjects with high and low manifest anxiety scores, and was sensitive to self-esteem stress.

This investigation was stimulated by the similarity between neuroticism and manifest anxiety, with the implication that similar results might be expected for high and low neuroticism groups, and the possibility that the addition of the extraversion variable would improve the distinguishability of such groups. The report of the research is divided into three chapters.

The first chapter begins with a review of studies supporting the use of alternate forms of the inkblot test, and proceeds with a defense of Rorschach variables as indices of stress. The major hypotheses of the present research may be seen as an outgrowth of an investigation based upon both assumptions, conducted within the context of personality study.

In the second chapter the experimental design is presented. Selection of the subjects, treatments administered, and the assessment of the Rorschach variables are detailed.

The research findings relevant to the two major hypotheses are presented and discussed in the third chapter. This chapter is followed by a summary of these findings, and the conclusions.

CHAPTER I

REVIEW OF THE LITERATURE

Only studies dealing with the Rorschach inkblot technique in its individually administered, essentially clinical form will be included in the review of the literature. Two of these investigations have in common the use of psychological stress as an intervening variable and Rorschach scoring categories as dependent variables. The first section of the chapter contains a summary of investigations which have made evaluative comparisons of the Rorschach and Behn-Rorschach[1] and their respective sensitivities to stress. In the second section, a study which extended these techniques to the assessment of psychological variables is reviewed, and related to the dimensions of neuroticism and extraversion. The chapter is concluded with a statement of the major hypotheses of this thesis.

1. The Rorschach, Behn-Rorschach, and Stress.

Three studies comparing the Rorschach and Behn-Rorschach in the individually administered form will be

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1 Hans Zulliger, The Behn-Rorschach Test, Hans Huber, Bern, 1941, p. 200. Distributed in the United States by Grune and Stratton, New York.

mentioned briefly. Rosenwald[2], using hospitalized chronic alcoholics, concluded that the two inkblot series were essentially equal with respect to formal scoring factors. His meager statistical presentation, however, does not permit adequate evaluative comparisons. Mayman[3] included the Harrower along with the Rorschach and Behn-Rorschach[4], with applicants for training in psychiatry serving as subjects. Controlling for order of presentation, each subject was given all three tests. He reported constant differences in the frequency of occurrence of major determinants, differences in stimulus value, and differences relating to the position of respective cards in the three series. The time interval between each test administration was six to twenty-four hours, so that the contaminating factor of fatigue must be considered when interpreting his results. Singer's[5] comparison of the Rorschach and Behn was based on a sample of ten

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2 Alan K. Rosenwald, "A Comparison of the Rorschach and Behn-Rorschach Tests Based on a Study of Chronic Alcoholic Subjects", American Psychologist, Vol. 2, No. 8, August 1947, p. 270.

3 Martin Mayman, "A Comparitive Study of the Rorschach, Harrower, and Behn-Eschenberg Inkblot Tests", American Psychologist, Vol. 2, No. 8, August 1947, p. 270, unpublished Master's thesis, New York University, 1947.

4 In the remainder of this manuscript, the Behn-Rorschach will be referred to simply as the Behn.

5 Jerome L. Singer, "The Behn-Rorschach Inkblots: A Preliminary Comparison With the Original Rorschach Series", Journal of Projective Techniques, Vol. 16, No. 2, June 1952, p. 238-245.

cases, with subjects ranging in age from six to fifty-four. His use of statistical procedures is so unclear as to leave the high reliabilities and degree of similarity reported for the two inkblot tests open to question.

Recognizing the need for an alternate form of the Rorschach so that the retesting requirement of well controlled experimental designs could be met, Eichler[6] compared the Rorschach and Behn-Rorschach. Using 105 male undergraduates and counter-balanced administration of the two tests, he concluded that the Behn cannot be considered an equivalent form, but was sufficiently similar for use in research studies, and preferable to retesting with the Rorschach.

Proceding with an investigation of the effects of stress on Rorschach performance, Eichler[7] employed threat of increasing intensities of electric shock to induce stress in his subjects. There were thirty male university students in his experimental group, to which stress was administered, and thirty in his control group, to which no stress was administered. Significant differences were found in the stress group for the scoring categories of Sh., wgt., W, R, and Do, with the categories of P, Rej., and C wgt., approaching

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6 Robert M. Eichler, "A Comparison of the Rorschach and Behn-Rorschach Inkblot Tests", Journal of Consulting Psychology, Vol. 15, No. 3, June 1951, p. 185-189.

7 Robert M. Eichler, "Experimental Stress and Alleged Rorschach Indices of Anxiety", Journal of Abnormal and Social Psychology, Vol. 46, No. 3, July 1951, p. 344-355.

significance, all in the predicted directions. He concluded that many of the individual scoring categories involving the use of shading, considered particularly sensitive to anxiety by Rorschach experts, did not detect it in his investigation in spite of fairly strong evidence that anxiety, defined here as situational or experimental stress induced by threat of electric shocks, had in fact been induced in the subjects. The results further emphasized the need for careful interpretation of any given Rorschach protocol.

From the standpoint of developments since the work of Eichler, two aspects of his research might be critised. His studies controlled for productivity, or the differences between individuals in the total number of responses to the test, through square root transformations to normalize the data. Analysis of covariance was then employed to evaluate differences.[8] This was done on the assumption that the correlation between productivity and the number of Rorschach responses is different from zero, an assumption which has received support from most factor analytic studies of scoring categories. It is not clear, however, just how productivity influences a given scoring category.[9]

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8 Robert M. Eichler, "Some Comments on the Controlling of Differences in Responses on the Rorschach Test", Psychological Bulletin, Vol. 48, No. 3, May 1951, p. 257-259.

9 J. R. Wittenborn, "Some Comments on Confounded Correlations Among Rorschach Scores", Journal of Consulting Psychology, Vol. 23, No. 1, February 1959, p. 75-77.

A second criticism arises from Eichler's method of inducing stress. Lazarus, Deese, and Osler[10] have noted that physiological stress and psychological stress involve different problems of definition, one of the most basic being that there is no adequate way of defining the psychological condition corresponding to physiological homeostasis. The threat of physical or physiological discomfort such as the anticipation of electric shocks used by Eichler would appear quite distinct from the clinical situation to which he generalized. Both Beier[11] and Kates[12] utilized personality evaluation techniques which induce experimental or situational stress, but have the advantage of negating the necessity for anticipation of physical or physiological distress on the part of the subject.

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10 Richard S. Lazarus, James Deese, and Sonia Osler, "The Effects of Psychological Stress Upon Performance", Psychological Bulletin, Vol. 49, No. 4, July 1952, p. 293-317.

11 Ernst G. Beier, "The Effect of Induced Anxiety on Flexibility of Intellectual Functioning", Psychological Monographs, Vol. 65, No. 9, 1951, Whole No. 326.

12 Solis L. Kates, "Subject's Evaluations of Annoying Situations After Being Described as Well Adjusted and Poorly Adjusted", Journal of Consulting Psychology, Vol. 16, No. 6, December 1952, p. 429-434.

Schwartz and Kates[13] have also compared the Rorschach and Behn under stress and non-stress conditions with twenty-four female undergraduates as subjects. Their stress procedure was a typewritten personality evaluation[14] advising that the subject was poorly adjusted. To control for productivity, the subject was asked when necessary to give additional responses, so that a minimum of two responses were obtained for Cards I through IX, and four responses to Card X. By fixing the number of responses given by an individual subject, the use of covariance analysis with its possible confounding influence was avoided and application was made of triple classification analysis of variance. For the non-stress group, the Behn was found to elicit more FK and FC responses, significant at the five percent level. Trends were found for the Rorschach to elicit more CF and higher RT's, and the Behn more FSh responses. Having found only two of sixteen comparisons for the two tests reaching significance, they concluded that the Rorschach and Behn were approximately equivalent for most response categories. Continuing their investigation of the over-all effects of stress on scoring categories, they found

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13 Fred M. Schwartz and Solis L. Kates, "Behn-Rorschach and Rorschach Under Standard and Stress Conditions", Journal of Consulting Psychology, Vol. 21, No. 4, August 1957, p. 335-338.

14 Kates, Ibid.

less W, less ShF, less Sh wgt., more F, and more m as a consequence of psychological stress.[15]

The possible differential effects of stress on the two inkblot tests were also assessed.[16] The Rorschach elicited shorter RT's and less FC under stress, significant at the five percent level. Tendencies were observed for F, FM, and KF to be differentially affected by stress.

Schwartz and Kates' conclusions were that the Behn and Rorschach are equivalent for most response categories. Where dissimilarities occur, they were attributed to differences in the stimulus properties of the tests, particularly with respect to shading and color.

Of particular interest in the studies of Eichler and Schwartz and Kates is the general agreement in their estimates of each subject's test-retest reliability for scoring categories. They found the reliabilities for shading and color low, but in both these studies, coefficients for W, F, M, and FM were of sufficient magnitude to be considered significant.

Schwartz and Kates have stated that the unreliability of shading categories may be due to their extreme sensitivity

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15 Fred Schwartz and Solis L. Kates, "Rorschach Performance, Anxiety Level, and Stress", Journal of Projective Techniques, Vol. 21, No. 2, 1957, p. 154-160.

16 Schwartz & Kates "Behn-Rorschach and Rorschach Under Standard and Stress Conditions", Journal of Consulting Psychology, Vol. 21, No. 4, 1957, p. 335-338.

to situational stress. Comparisons of the stress and non-stress reliability coefficients for scoring categories might provide information relative to both stability and sensitivity of these categories. These findings were as follows:

> .....it should be noted that the introduction of stress results in significant reversals in the coefficients for FM and M, a change from near zero to significant correlations of KF and FC', and a change from significant to non-significant coefficients for W, F, M, and Rej.[17]

They argued that the finding of significantly high coefficients for W, F, M, FM, m and Rej. in their non-stress or control group in spite of known dissimilarities in the tests can be interpreted as evidence supporting the stability of these variables in the evaluation of personality characteristics. To summarize, both Eichler and Schwartz and Kates concluded the Rorschach and Behn are similar but not equivalent test forms. The tests were felt to be suitable for use in research studies, but interchangeable application to the individual case must be approached with extreme caution.

In this section, studies which support the use of the Rorschach and Behn as alternate test forms for research applications, and the sensitivity of the Rorschach scoring categories to induced situational stress have been reviewed. In the next section, the use of these methods to distinguish between groups differing on level of manifest anxiety will

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17 Schwartz and Kates, Ibid.

be discussed. The relationship between manifest anxiety and neuroticism will be pointed out, and the major hypothesis of this thesis formulated.

2. The Rorschach, Manifest Anxiety, and Neuroticism.

As one aspect of their investigation, Schwartz and Kates[18] studied the effects of situational stress and manifest anxiety level upon Rorschach scoring categories. Subjects for the investigation were twenty-four female undergraduate university students, twelve selected from the upper twenty percent and twelve from the lower twenty percent of the Manifest Anxiety Scale[19] distribution. Minimal environmental stress, as evaluated by interview and questionnaire, existed in these subjects. The procedure involved counterbalancing of the Rorschach, and Behn, controlling for productivity as described earlier in this manuscript, and matching of control and experimental subjects on the basis of their psychograms. For the experimental group, initial testing with the Rorschach or Behn was followed in one to two weeks by the introduction of situational stress by means

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18 Fred Schwartz and Solis L. Kates, "Rorschach Performance, Anxiety Level, and Stress", Journal of Projective Techniques, Vol. 21, No. 2, June 1957, p. 154-160.

19 Janet A. Taylor, "A Personality Scale of Manifest Anxiety", Journal of Abnormal and Social Psychology, Vol. 48, No. 3, April 1953, p. 285-290.

of a typewritten personality evaluation[20], then immediate retesting with the alternate inkblot form. Subjects were tested individually by the same examiner. Procedure for the control group differed only in that no situational stress was administered.

It may be recalled from an earlier statement that Schwartz and Kates found significantly less W, more F, more m, and less ShF in subjects to whom experimental stress had been administered. They also found that high anxious control subjects had significantly longer RT's, less M, and more F then the low anxious controls. Under the stress condition, high and low anxious subjects were not differentially affected, but it was shown that the high anxious subjects responded to both the stress and non-stress in the same way as low anxious subjects under stress, i.e. they produced less W, more F, more m, and less ShF. Schwartz and Kates conclusions were:

1. The Rorschach is sensitive to situational influences such as self-esteem stress.
2. Self-esteem stress induces changes in the Rorschach which imply behavioral constriction.
3. The Rorschach is sensitive to differences between high and low anxious S's, as defined by the M.A.S.
4. The responses elicited in the high anxious group imply a degree of personality impoverishment.

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20 Solis L. Kates, "Subject's Evaluations of Annoying Situations After Being Described as Well Adjusted and Poorly Adjusted", Journal of Consulting Psychology, Vol. 16, No. 6, December 1952, p. 429-434.

5. The direction of change for some scoring categories in S's under stress depends upon the kind or amount of stress employed.....[21]

Their findings, and presumably the failure to find differential responses to stress in their high and low anxious groups were interpreted as a function of the kind and amount of stress employed. The author of the present study would tend to agree that the expected relationship between amount of stress and behavioral indices of stress is not necessarily one to one, and also that the kind of stress employed would exert considerable influence.

An additional consideration would appear to be that the subject's themselves may differ on a variable other than the anxiety readiness the Manifest Anxiety Scale purports to measure. The Maudsley Personality Inventory[22], which Eysenck has used to isolate individuals differing on the dimensions of neuroticism and extraversion would seem to be a promising tool to employ for further research of this nature with the Rorschach.

To place the Manifest Anxiety Scale more specifically within its theoretical context, it must be recalled that the scale was originally conceived as an attempt to isolate

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21 Schwartz and Kates, "Rorschach Performance, Anxiety Level, and Stress", Journal of Projective Techniques, Vol. 21, No. 2, June, 1957, p. 159.

22 Arthur R. Jensen, "The Maudsley Personality Inventory", Acta Psychologica, Vol. 14, No. 4, 1958, p. 314-324.

individuals possessing varying amounts or degrees of drive, the Hullian concept. The relationship between drive, motivation, and anxiety, ensconced in the framework of Hull's learning theory naturally stimulated personality theories.

In 1955, Eysenck[23] critically reviewed attempts to unite theory of learning and theory of personality. These efforts had been largely unrewarded, according to Eysenck, because they did not first establish the facts of personality in the way facts of learning have been established. He held that there are two necessary steps in personality investigation. The steps are, first, the establishment of an objectively identified dimensional framework and, second, to find the psychological or physiological bases underlying these dimensions.

His own factor-analytically derived constructs of neuroticism and extraversion Eysenck[24] views as empirically and experimentally sound descriptions of major personality variables, satisfying his first requirement of personality investigation. Furthermore, the neuroticism dimension, as measured by the Maudsley Personality Inventory, bears a close resemblance to anxiety as measured by the Manifest

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23 H. J. Eysenck, "A Dynamic Theory of Anxiety and Hysteria", Journal of Mental Science, Vol. 101, No. 422, 1955, p. 28-51.

24 H. J. Eysenck, Dimensions of Personality, London, Kegan Paul, 1947, 308 p.

Anxiety Scale, and like the scale, can be regarded as an indicator of drive level.[25] Bendig[26] has reported a correlation of .77 between the Manifest Anxiety Scale and the neuroticism scale of the Maudsley Personality Inventory. This finding suggests the possibility that individuals with high and low neuroticism scores might respond differentially to the Rorschach in a manner similar to Schwartz and Kates' subjects, who had high and low manifest anxiety scores. With a correlation of -.35 between the Manifest Anxiety Scale and the extraversion scale of the Maudsley Personality Inventory, the possibility that an even broader scope of differentiation might occur is observed.

The major hyptheses of this research may now be stated, and it may be seen that the project falls within the area of investigation of psychological bases of the dimensions of neuroticism and extraversion. The purpose of this investigation is two-fold. In one aspect, the Rorschach responses of individuals selected on the basis of their high and low neuroticism scores and high and low extraversion scores on the Maudsley Personality Inventory will be compared. In another aspect, assessment of the Rorschach

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25 H. J. Eysenck, "Reminiscence, Drive, and Personality Theory", Journal of Abnormal and Social Psychology, Vol. 53, No. 3, November 1956, p. 328-333.

26 A. W. Bendig, "Extraversion, Neuroticism, and Manifest Anxiety", Journal of Consulting Psychology, Vol. 21, No. 5, October 1957, p. 398.

responses of these individuals while under experimental psychological stress will be made, to determine whether they have responded differentially. Formulation of the research hypothesis for each aspect, stated in the null form, may now be made. The Rorschach responses of individuals having high and low neuroticism and high and low extraversion scores will not differ significantly. The Rorschach responses of these individuals will not be affected by the introduction of experimental psychological stress.

CHAPTER II

EXPERIMENTAL DESIGN

This chapter describes the procedures followed in conducting an experiment to test the hypotheses proposed in the preceding chapter. Presentation of the design has been broken into four sections.

The first section is concerned with the selection and description of the four experimental groups. In the second section, conditions administered to the experimental groups are discussed. Method of scoring and statistical procedures comprise the third section. The fourth section specifies the fifteen Rorschach scoring categories.

1. Selection and Description of the Experimental Groups.

The population from which the four experimental groups were selected consisted of 170 female student nurse volunteers. All were in their third year of training, and were on psychiatric affiliation at Toledo State Hospital at the time of participation in this research. These volunteers represented ten schools of nursing in five cities, all within a radius of 160 miles of Toledo State Hospital. Over the six months period while the data were being gathered, 196 female student nurse affiliates were trained at the hospital, with

the 170 volunteer participants for this study making up eighty-six percent of the total number.

The M.P.I.[1] was administered to each subject individually, and was constant for all subjects. This method of administration was chosen because schedule demands imposed by the Education Department at Toledo State Hospital made it impossible to assemble all subjects simultaneously. The rooms in which the subjects were tested were large, well-lighted, attractively decorated classrooms. The M.P.I. was administered in accord with directions in the manual.[2] The maximum attainable scores for neuroticism and extraversion respectively is forty-eight. Obtained range of neuroticism scores for these subjects was two through forty-six, and of extraversion scores, eight through forty-eight. The product moment correlation between the two scales for these subjects was -.196, with a standard error of .007. Test-retest reliability was estimated separately for the two dimensions of the inventory by means of the Kuder-Richardson formula.[3] For the neuroticism scale, reliability was estimated at .883,

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1 Arthur R. Jensen, "The Maudsley Personality Inventory", Acta Psychologica, Vol. 14, No. 4, 1958, p 314-324.

2 H. J. Eysenck, Manual of Maudsley Personality Inventory, London, University of London Press, Ltd., 1959, 8 p.

3 J. P. Guilford, Fundamental Statistics in Psychology and Education, third edition, 1956, McGraw Hill Book Company, Inc., New York, 1956, 455 p.

and for the extraversion scale, at .862. The mean for the neuroticism scale was 21.40, and the standard deviation, 9.36. Mean of the extraversion scale was 29.51, and standard deviation, 8.54.

Upon establishing the individual subject's scores on the two scales of the M.P.I. these scores were charted on a scattergram, so that the position of each subject's scores with respect to the entire volunteer population could be noted. Eight subjects representing each extreme of the dimensions of neuroticism and extraversion were then assigned to their respective experimental groups. The groups were designated, each according to its composition, Low Neuroticism-Low Extraversion, Low Neuroticism-High Extraversion, High Neuroticism-Low Extraversion, and High Neuroticism-High Extraversion. For convenience, these groups will be designated Lo N-Lo E, Lo N-Hi E, Hi N-Lo E, and Hi N-Hi E, respectively, in the remainder of this manuscript. The M.P.I. scores of the subjects making up each group may be found in Appendix 1. A description of each of the groups, based upon the neuroticism and extraversion dimensions follows.

Lo N-Lo E. Neuroticism scores within this group ranged from two through fourteen, with a mean of 11.00 and standard deviation of 4.24. Extraversion scores ranged from sixteen through twenty-four, had a mean of 20.48, and standard deviation of 3.04.

Lo N-Hi E. The range of neuroticism scores for this group was four through twelve, with a mean of 7.75 and a standard deviation of 2.68. The range was thirty-eight through forty-six for the extraversion scores, with the mean and standard deviation 40.63 and 2.69, respectively.

Hi N-Lo E. These neuroticism scores ranged from thirty-two through forty, had a mean of 35.38, and standard deviation of 2.87. Extraversion scores ranged from eight through twenty-one, with a mean of 14.86, and standard deviation of 4.70.

Hi N-Hi E. The range of neuroticism scores was twenty-eight through thirty-six, with a mean of 32.50, and standard deviation of 3.00. The range of extraversion scores was thirty-six through forty-eight, with a mean of 41.50, and standard deviation of 4.18.

Differences between means of the groups for each dimension were tested through the use of t tests[4], and it was found that for each dimension the Lo components did not differ significantly from each other, but in all comparisons with the Hi differences significant at the .01 level were found. Conversely, the Hi components did not differ significantly from each other, but significance at the .01 level

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4 J. P. Guilford, Fundamental Statistics in Psychology and Education, third edition, New York, McGraw Hill, 1956, p. 220.

was found when compared with the Lo. The results of these tests are reported in Appendix 2.

2. Conditions Administered to the Experimental Groups.

For the initial testing, subjects within each of the experimental groups were assigned to one of two examiners,[5] and to either the Rorschach or Behn on a chance basis, but in such a manner that counter-balancing for examiner and test was achieved. Length of time elapsing from the administration of the M.P.I. to initial testing with the Rorschach or Behn varied from five to thirty-two days.

The general method of Rorschach administration followed by both examiners was as directed by Klopfer, et. al.,[6] with certain modifications to allow for controlling the number of responses given by each subject. These modifications involved, after completion of the standard free-association and inquiry periods, the request for a minimum of two responses to Cards I through IX, and a minimum of four responses to Card X. This was done by handing the card for which another response or responses was desired to the

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5 Both examiners were female, holders of Master of Arts degrees in Psychology, and had a minimum of five years' experience with the Rorschach in various clinical settings.

6 Bruno Klopfer, Mary D. Ainsworth, Walter G. Klopfer, and Robert R. Holt, Developments in the Rorschach Technique, Volume I, Yonkers-on-Hudson, World, 1954, x-725 p.

subject and asking her to find something else in addition, or to find something new. Encouragement was given when necessary. If the subject gave more than the minimum of twenty-two responses without prompting, only the first two responses to Cards I through IX and the first four responses to Card X were utilized for the purposes of this experiment. This is the same procedure for controlling productivity as that used by Schwartz and Kates,[7] described in the preceding chapter.

If a subject was unable to produce the required number of responses per card, she was dropped from the study and replaced by an alternate. During the initial testing, two subjects were dropped, and during the second testing, one subject was lost. Subjects who were adjudged on the basis of the initial test to be too emotionally unstable, or who were known to be undergoing psychiatric treatment were also eliminated. Three subjects were dropped for these reasons. In the event a subject was dropped from the study, she was replaced by an alternate so that the number of subjects in each of the experimental groups remained at eight.

At the conclusion of the initial testing session, subjects were advised of the requirement of secrecy, and

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7 Fred Schwartz and Solis L. Kates, "Behn-Rorschach and Rorschach Under Standard and Stress Conditions", Journal of Consulting Psychology, Vol. 21, No. 4, August 1957, p. 335-338.

frequently it was suggested they tell their classmates they had taken another test.

The second testing session was conducted in not less than seven nor more than fourteen days following the initial testing. In all instances, the same examiner administered both inkblot examinations to a given subject. After brief amenities, the subject was asked whether, during the last one or two weeks there had been:

1. Illness or accident in the family.
2. Separation of parents.
3. Very severe family quarrel.
4. Illness or physical upset to yourself within the past two or three days.
5. Separation from fiancee or steady boyfriend.
6. Anything else which has you particularly upset at the present time.[8]

This brief questionnaire was included to provide a rough index of stresses which might be operating on subjects outside the experimental situation. A total of nine "Yeses" were obtained, with at least one "Yes" per experimental group. The number of "Yeses" were, by experimental group, Lo N-Lo E, two; Lo N-Hi E, two; Hi N-Lo E, one; and Hi N-Hi E, four.

The subject was then handed a threatening personality evaluation,[9] which she was instructed to read. A

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8 Solis L. Kates, "Subjects' Evaluations of Annoying Situations After Being Described as Well Adjusted and Poorly Adjusted", Journal of Consulting Psychology, Vol. 16, No. 6, December 1952, p. 431.

9 Kates, Ibid.

sample of this evaluation as presented to each subject may be found in Appendix 3. Immediately after the subject had read the evaluation, it was suggested by the examiner that the subject take another test similar to the one she had taken last session, in order to be sure of the results. The subject was then given either the Rorschach or the Behn, to complete the counter-balancing for alternate test forms. Upon completion of this second examination, the subjects were debriefed relative to the purpose of the experiment, with emphasis on the need for secrecy. No instances of violation of the confidentiality of the research were encountered.

3. Scoring of the Rorschach and Behn Protocols and Statistical Treatment of the Data.

All the protocols were scored by a committee of three judges[10] according to rules set forth by Klopfer, et. al.,[11] The test protocols were coded, so that the judges were not aware whether a given response occurred during the initial or second test administration. For the

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10 The committee of judges was composed of the two examiners and one other psychologist on the staff at Toledo State Hospital. The latter's qualifications include the Ph.D. degree in Psychology plus ten years experience encompassing clinical, consulting, and teaching activities.

11 Bruno Klopfer, Mary D. Ainsworth, Walter G. Klopfer, Robert R. Holt, et. al., Developments in the Rorschach Technique, Volume I, Yonkers-on-Hudson, World, 1954, x-725 p.

Rorschach, initial and second testings were arranged randomly, and Card I scored for all subjects. This was followed by Card II, scored for all subjects, and so on through Card X. When differences arose among the judges, the scoring symbol assigned was determined by agreement of two of the three judges. The same procedure was followed in scoring the Behn protocols. Where multiple determinants occurred only the primary determinant was used for the statistical computations.

A psuedo three way analysis of variance[12] was computed to assess the effects of stress and test for differences among the experimental groups. When F ratios were significant, appropriate t tests were performed. For both the F and t tests, significance at the five percent level of confidence was required to reject the null hypothesis.

4. The Fifteen Rorschach Variables.

Although the scoring of the protocols was characterized by rigid adherence to Klopfer's directions, once the preliminary tabulation of the data had been made it was apparent by inspection that the frequencies within some scoring categories were too low to satisfy the assumptions

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12 Quinn McNemar, Psychological Statistics, third edition, New York, Wiley, 1962, 322 p.

of the statistical analysis. Consequently, five of the variables represent combinations of more refined scoring categories. These five variables and their compositions are listed below. Throughout the remainder of the manuscript designation of a given Rorschach variable, such as W, d, or Fc should be regarded according to Klopfer's[13] definition, unless otherwise specified in this section.

-DdS.- This variable includes d, dr, dd, di, de, S, and s.

-Color.- All chromatic color determinants have been included in this variable. They are FC, CF, and C.

-FSh.- The combination of determinants comprising this variable are Fc, FK, Fk, and FC' using suggestions by Hertz[14], as the basis for grouping.

-ShF.- Again following Hertz[15], cF, KF, kF, and C'F were included.

-Shading.- This includes all the shading categories, mentioned above.

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13 Bruno Klopfer, Mary D. Ainsworth, Walter G. Klopfer, Robert R. Holt, Developments in the Rorschach Technique, Volume I, Yonkers-on-Hudson, World, 1954, x-725 p.

14 Marguerite R. Hertz, "Suicidal Configurations on Rorschach Records", Rorschach Research Exchange, Volume 12, p. 3-59.

15 Hertz, Ibid.

Three other variables require some definition and explanation.

-R.T.- This variable refers to the subject's initial reaction times to the inkblots. It is derived by taking the mean of the ten reaction times for a given test administration. Where rejection of a card occurred, the subjects median reaction time to the series of ten was used for the reaction time to the rejected card.[16]

-Forced Responses.- When it was necessary to request an additional response to meet the requirement of twenty-two for a test administration, such a response was considered to have been forced. Thus, if a card were rejected, a subject would be considered as having two forced responses to any of the first nine cards, or four to the last card. This method was chosen as a rough index of rejection, again because of statistical considerations arising from the low frequency of card rejection during the free association.

-Minus Form Level.- Any response determined by the three judges to be of inaccurate or inadequate form quality was given minus score.

The seven remaining variables under consideration in this experiment were W, D, d, F, M, FM, and m, as defined by Klopfer, et. al.

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16 Alvin G. Burstein, "A Note on Time of First Responses in Rorschach Protocol", Journal of Consulting Psychology, Vol. 25, No. 6, December 1961, p. 549-550.

CHAPTER III

RESULTS AND DISCUSSION

In this chapter the statistical findings of the experiment will be considered. The section will cover the analysis of variance for the Rorschach variables with respect to the effects of the experimental psychological stress and the dimensions of neuroticism and extraversion, followed by a discussion of the results.

1. Neuroticism, Extraversion, and Stress.

The statistical findings for each of the fifteen Rorschach variables will be reported. While it was necessary to compute F values for neuroticism and stress separately from those for extraversion and stress, it should be noted that the same individuals make up the respective neuroticism and extraversion groups, and once these F values have been obtained, the design collapses to a simple comparison of the four groups. Appendix 4 contains the Tables summarizing the analysis of variance of each Rorschach variable for neuroticism and stress. In Table I a summary of these variances is presented. Appendix 5 contains the Tables summarizing the analysis of variance of each Rorschach variable for extraversion and stress, with Table II presenting a summary of these variances. When F values were beyond the accepted level of confidence, differences between group means were

Table I.-Estimates of Variance for the Fifteen Rorschach Variable by Neuroticism and Stress

Variable	Individuals	Neuroticism	Stress	N by S	Remainder
W	23.69	0.77	70.14[a]	0.39	3.10
D	16.19	14.06	27.56[b]	2.25	4.07
d	2.31	0.06	5.06	0.56	1.08
DdS	5.77	9.77	0.77	1.89	3.86
F	17.33	4.52	3.52	0.39	6.09
M	5.18	4.00	9.00	3.06	4.73
FM	11.81	9.00	1.56	0.25	7.27
m	0.93	1.89	0.02	0.77	0.82
Color	4.76	0.06	6.25	1.00	1.93
FSh	4.54	1.89	8.27	0.14	2.80
ShF	1.91	9.77	0.39	0.02	0.74
Shading	6.22	3.06	12.25	0.06	2.79
R.T.	18997.10	4761.00	89102.25	225.00	6791.49
Forced Responses	9.51	0.56	33.06	0.25	5.29
Minus Form Level	4.62	1.27	1.89	0.02	1.67

a Double underlining designates a $p \leq .01$.
b Single underlining designates a $p \leq .05$.

Table II.-Estimates of Variance due to Individuals, Extraversion and Stress for the Fifteen Rorschach Variables

Variable	Individuals	Extraversion	Stress	E by S	Remainder
W	23.65	1.89	<u>70.14</u>[a]	0.14	3.11
D	16.61	1.56	<u>27.56</u>[b]	6.25	3.94
d	2.31	____	<u>5.06</u>	____	1.10
[illegible]	5.87	6.89	0.77	4.52	3.77
F	17.44	1.27	3.52	6.89	5.87
[illegible]	5.31	0.25	9.00	0.56	4.81
FM	12.06	1.56	1.56	0.06	7.28
m	0.98	0.39	0.02	0.14	0.84
Color	4.76	0.06	6.25	____	1.96
FSh	4.54	0.02	8.27	2.64	2.78
ShF	1.91	0.39	0.39	0.02	1.05
Shading	6.33	0.56	<u>12.25</u>	3.06	2.69
R.T.	19155.77	1.00	<u><u>89102.25</u></u>	8100.00	6528.99
Forced Responses	9.32	6.25	<u>33.06</u>	7.56	5.05
Minus Form Level	4.51	4.52	1.89	0.14	1.68

a Double underlining designates a $p \leq .01$.
b Single underlining designates a $p \leq .05$.

evaluated. Table III contains the t values arising from the evaluation of the effects of stress, and Table IV contains the t values arising from the evaluation of Rorschach variable ShF. Appendix 6 presents the means and standard deviations of the fifteen Rorschach variables for the four groups on the first and second test administration.

1. -W.- The F values for the effects of neuroticism and extraversion did not reach the accepted level of confidence. The F values for the effect of stress are beyond the accepted level of confidence, attaining significance beyond the one percent level. The mean of the Lo N-Hi E group changed significantly with the introduction of stress, exceeding the accepted level of confidence. The t value was significant beyond the two percent level. The mean of Hi N-Lo E group changed significantly with the introduction of stress.

2. -D.- The F values for the effects of neuroticism and extraversion did not reach the accepted level of confidence. The F values for the effect of stress are beyond the accepted level of confidence. The mean of the Hi N-Hi E group changed significantly with the introduction of stress.

3. -d.- The F values for the effects of neuroticism and extraversion did not reach the accepted level of confidence. The F values for the effect of stress are beyond the accepted level of confidence. None of the means of the groups changed significantly with the introduction of stress.

Table III.-Means and t Values for the Assessment of the Effects of Experimental Stress in the Four Groups for Six Rorschach Variables

Variable		Group							
		Lo N-Lo E		Lo N-Hi E		Hi N-Lo E		Hi N-Hi E	
		Mean	t	Mean	t	Mean	t	Mean	t
W	Test 1[a]	7.375	1.594	7.125	3.274[c]	7.000	2.616[d]	6.750	2.167
	Test 2[b]	5.625		4.375		4.750		5.125	
D	Test 1	10.750	.291	9.000	1.076	10.500	1.563	10.375	2.922
	Test 2	11.000		10.625		11.625		12.625	
d	Test 1	1.125	.735	.875	2.119	1.125	1.509	1.375	.284
	Test 2	1.375		2.125		2.000		1.250	
Shading	Test 1	4.125	.154	5.000	2.113	4.000	.942	4.375	1.092
	Test 2	4.000		3.500		3.250		3.250	
R.T.	Test 1	15.863	1.722	13.525	1.874	13.450	2.803	20.188	.875
	Test 2	24.538		20.675		24.300		23.513	
Forced Responses	Test 1	4.125	.112	3.750	1.689	2.625	1.719	2.875	1.620
	Test 2	4.250		5.000		4.000		4.625	

a In this table Test 1 denotes the inkblot test administered under the non-stress condition.

b In this table Test 2 denotes the inkblot test administered under the stress condition.

c Double underlining designates a $p \leq .02$.

d Single underlining designates a $p \leq .05$.

Table IV.-Means and t Values for the Comparison of the Four Groups With Respect to Rorschach Variable ShF

	Mean	t
Lo N-Lo E versus	.813	.135
Lo N-Hi E	1.125	
Lo N-Lo E versus	.813	.356
Hi N-Lo E	.375	
Lo N-Lo E versus	.813	.356
Hi N-Hi E	.375	
Lo N-Hi E versus	1.125	.581
Hi N-Lo E	.375	
Lo N-Hi E versus	1.125	.581
Hi N-Hi E	.375	
Hi N-Hi E versus	.375	———
Hi N-Lo E	.375	

4. -DdS.- The F values for the effects of neuroticism and extraversion did not reach the accepted level of confidence. The F values for the effect of stress did not reach the accepted level of confidence.

5. -F.- The F values for the effects of neuroticism and extraversion did not reach the accepted level of confidence. The F values for the effect of stress did not reach the accepted level of confidence.

6. -M.- The F values for neither the effects of neuroticism and extraversion nor the effect of stress reached the accepted level of confidence.

7. -FM.- The F values for the effects of neuroticism and extraversion and the effect of stress did not reach the accepted level of confidence.

8. -m.- The F values for the effects of neuroticism and extraversion and the effect of stress failed to reach the accepted level of confidence.

9. -Color.- The F values for the effects of neuroticism and extraversion did not reach the accepted level of confidence. The F values for the effect of stress did not reach the accepted level of confidence.

10. -FSh.- The F values for the effects of neuroticism and extraversion and the effect of stress failed to reach the accepted level of confidence.

11. -ShF.- The F value for the effect of neuroticism is beyond the accepted level of confidence. Evaluation of the differences between group means failed to yield any t values reaching the accepted level of confidence. The F values for the effect of extraversion and the effect of stress did not reach the accepted level of confidence.

12. -Shading.- The F values for the effects of neuroticism and extraversion failed to reach the accepted level of confidence. The F values for the effect of stress are beyond the accepted level of confidence. None of the means of the groups changed significantly with the introduction of stress.

13. -R.T.- The F values for the effects of neuroticism and extraversion did not reach the accepted level of confidence. The F values for the effects of stress were beyond the accepted level of confidence, reaching significance at the one percent level. The mean of the Hi N-Lo E group changed significantly with the introduction of stress.

14. -Forced Responses.- The F values for the effects of neuroticism and extraversion did not reach the accepted level of confidence. The F values for the effect of stress are beyond the accepted level of confidence. None of the group means changed significantly with the introduction of stress.

15. -Minus Form Level.- The F values for the effects of neuroticism and extraversion did not reach the accepted

level of confidence. The F values for the effect of stress did not reach the accepted level of confidence.

In summary, the effect of neuroticism was found to be significant only for Rorschach variable ShF. Differences between means of the groups failed to reach the accepted level of confidence. The effect of extraversion was not significant for any of the Rorschach variables. The effect of stress was found to be significant for six of the fifteen Rorschach variables, with W, D, d, Shading, R.T., and Forced Responses all exceeding the accepted level of confidence. For W, the means of the Lo N-Hi E and Hi N-Lo E groups changed significantly. For D and d the mean of the Hi N-Hi E group changed significantly. For R.T., the mean of the Hi N-Lo E group changed significantly. None of the group means changed significantly for the variables of Shading and Forced Responses. No interactions of neuroticism by stress nor extraversion by stress reached the accepted level of confidence.

2. Discussion.

The statistical analyses indicate that the null hypothesis must be accepted with respect to the dimensions of neuroticism and extraversion. The neuroticism variable was significant for only one Rorschach variable of the total of fifteen and could have occurred by chance. The extraversion variable was not significant for any of the fifteen

Rorschach variables. These findings were unexpected, since the high correlations reported between neuroticism and manifest anxiety,[1] suggested that this aspect of Schwartz and Kates'[2] findings would be at least partially replicated in the present investigation. While some of Schwartz and Kates' conclusions were based upon trends in their data significant at the ten percent level of confidence, even these trends were not found in the present investigation. (Significance at the ten percent level would require F values of 2.88 or greater.)

A possible explanation for these results would seem to lie in confounding which could feasibly have influenced the selection of subjects and their subsequent performance in connection with the experiment. Factors such as imminent examinations or distressing incidents occurring in conjunction with the subjects' academic and practical experiences could not be controlled either at the time of the M.P.I. administration or the two ensuing inkblot administrations. Some subjects, as indicated in Chapter II of this manuscript, reported upsets in their personal and private lives. It was

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1 A. W. Bendig, "Extraversion, Neuroticism, and Manifest Anxiety", Journal of Consulting Psychology, Vol. 21, No. 5, October 1957, p. 398.

2 Fred Schwartz and Solis L. Kates, "Rorschach Performance, Anxiety Level, and Stress", Journal of Projective Techniques, Vol. 21, No. 2, June 1957, p. 154-160.

also learned near the conclusion of the experiment that some of these subjects, at regular intervals of their nurses training program received personal evaluations which were described to the investigator as similar in several respects to the threatening personality evaluation utilized to induce the experimental psychological stress. From knowledge of these three factors it would follow that the anxiety level of many of these subjects could not be considered minimal at any given phase of the experiment, and further that the stress inducing technique cannot be assumed to have equivalent value for all subjects. Thus the findings relative to this aspect of the experiment cannot be considered an adequate test of the proposed hypothesis or the underlying theory.

Turning to the second aspect of the investigation, the null hypothesis was rejected for six of the fifteen Rorschach variables under consideration. Significantly less W, more D, more d, less Shading, longer R.T., and an increase in Forced Responses were elicited when experimental psychological stress was introduced. These results are in general agreement with those of both Schwartz and Kates[3] and Eichler[4] with respect to W., R.T., and Forced Responses to the extent

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3 Schwartz and Kates, Ibid.

4 Robert M. Eichler, "Experimental Stress and Alleged Rorschach Indices of Anxiety", Journal of Abnormal and Social Psychology, Vol. 46, No. 3, July 1951, p. 344-355.

that the term Reject used in these two studies is equivalent to the Forced Responses variable of the present investigation. The decrease in the composite Shading variable used in the present investigation is also in agreement with Schwartz and Kates[5] findings for Sh. wgt. Thus it becomes clear that in spite of the distinct probability that the anxiety level of the subjects used in this research was generally elevated, the same implications with regard to an increase in behavioral constriction and decrease in abstraction were observed. Even though the original level of anxiety may vary to an unknown degree, results of the present research imply considerable consistency in the changes these Rorschach variables undergo in the presence of situational stress.

Significantly more D and d were elicited in subjects under experimental stress. Examination of these findings for D and d along with those for W., R.T., and Forced Responses suggest the interpretation that subjects under stress approached the task at a less abstract, more practical level. Comparing the work of Schwartz and Kates[6] and Eichler[7] with this investigation, it is noted that both the

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5 Schwartz and Kates, "Rorschach Performance, Anxiety Level, and Stress", Ibid.

6 Schwartz and Kates, Ibid.

7 Robert M. Eichler, "Experimental Stress and Alleged Rorschach Indices of Anxiety", Journal of Abnormal and Social Psychology, Vol. 46, No. 3, July 1951, p. 344-355.

earlier studies reported a significant increase in F and m while the present study yielded no significant changes in the F or m variables. Neither previous investigation reported findings for D or d, but both interpreted their findings as indicative of a constricting effect on behavior occurring in subjects under stress. Results for subjects of the present research imply that a shift in approach to the task occurred, with the stress having produced an immersion in the task at a more practical, obvious level, less abstract than previously.[8] The behavioral implications associated with the Rorschach variable changes which occurred in the present investigation are similar to those of Schwartz and Kates and Eichler, but manifested themselves in different ways.

Again, the possible confounding effects of uncontrolled stress and anxiety from sources outside the experiment proper cannot be accurately assessed, but since the overall effect of stress upon the Rorschach variables was similar, the question may be posed as to whether or not university students and student nurses might respond differently to this kind of psychological stress. It is doubtful that student nurses as a group and university students as a group can be considered equivalent on the basis of either

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8 Bruno Klopfer, Mary D. Ainsworth, Walter G. Klopfer, and Robert R. Holt, Developments in the Rorschach Technique, Volume I, Yonkers-on-Hudson, World, 1954, p. 305.

socio-economic status or intellectual ability. The response of those student nurse subjects who had been previously exposed to personal evaluations may in some instances have been a "buckling down" to the more obvious, practical aspects of the situation. Such a response or reaction would partially account for the shift in approach suggested by this experimental data, and would be consistent with the student's having nearly completed her nurse's training, as these subjects had.

With the strong probability of interference from anxiety and stress outside the experiment, and since the Rorschach did not differentiate between levels of high and low neuroticism and high and low extraversion, interpretation of the specific response changes of these groups under experimental psychological stress must be somewhat tentative. It might be argued, however, that the changes which occurred under stress provide moderate support for Eysenckian theory, when stated in terms of behavioral implications.

Examination of Table III reveals that stress elicited a significant decrease in W and a significant increase in R.T. in the Hi N-Lo E group. This group corresponds to Eysenck's dysthymics, and the findings tend to confirm the relationship between neuroticism and manifest anxiety

suggested by Eysenck[9]. The argument here follows from the assumption that the Hi N-Lo E group, or neurotic introverts, are roughly comparable to high anxious or high drive individuals. Thus the Lo N-Lo E group might be characterised as low drive, introverted individuals, and again referring to Table III, it is noted that while responding in the same general direction as the other three groups, no significant changes were elicited. The behavioral implication here would be that these Lo N-Lo E individuals are more constricted in their responsiveness to stress than the other three groups. These findings are also in agreement with those of Schwartz and Kates for their high and low anxious groups.

Continuing this line of reasoning, the Lo N-Hi E, or low drive, extraverted individuals were responsive to the situational stress, as indicated by significantly less W, but displayed little inclination to channelize or focalize their responses. The high drive, extraverted individual, to the extent represented by the Hi N-Hi E group, responded behaviorally by an increased interest in the practical, obvious aspects of the situation, as indicated by the significant increase in D. Noting further in Table III that the Hi N-Hi E group decreased slightly in d, or interest in the more

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9 H. J. Eysenck, "Reminiscence, Drive, and Personality Theory", Journal of Abnormal and Social Psychology, Vol. 53, No. 3, November 1956, p. 328-333.

minute details of experience[10], while the other three groups showed a slight increase in amount of the d variable elicited. The interpretation that the reaction of these individuals to the situational stress could be considered an attempt at obvious conformity, but with perhaps less depth than the other groups might be made. Such surface conformity to the demands of a situation would be congruent with Eysenck's description of Hi N-Hi E individuals as possessing hysterico-psychopathic characteristics.

These comments relative to the interpretation of specific changes elicited in the four groups under stress are speculative both from the standpoint of interference from uncontrolled anxiety arising outside the experiment, and since they are based on significant changes arising from best two significant's out of thirteen.

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10 Bruno Klopfer, Mary D. Ainsworth, Walter G. Klopfer, and Robert R. Holt, Developments in the Rorschach Technique, Volume I, Yonkers-on-Hudson, World, 1954, p. 306.

SUMMARY AND CONCLUSIONS

The purpose of the present research is to investigate the effects of psychological stress in groups of subjects differing on certain personality variables. Eysenck's dimensions of neuroticism and extraversion were the personality variables under consideration.

The M.P.I. was administered to 170 female student nurses who had volunteered for the research. Four experimental groups, each consisting of eight subjects, were selected from the high and low scores on the neuroticism and extraversion scales of the M.P.I. The Rorschach inkblot test or an alternate form, the Behn, was administered to each subject. Not less than seven nor more than fourteen days later, each subject was given a threatening personality evaluation followed immediately by the second administration of the inkblot test, so that counter-balancing for the form of the inkblot test was achieved. Analyses of variances for fifteen Rorschach variables were undertaken. The statistical results indicated first that the Rorschach variables did not differentiate between groups of subjects differing on the dimensions of neuroticism and extraversion. Confounding due to stress from sources outside the experiment raises doubt that this aspect of the investigation constituted a critical test of the null hypothesis or the underlying theory. The statistical results further indicated that six of the fifteen

Rorschach variables were sensitive to the experimental psychological stress. The behavioral implications associated with the changes occurring when stress was introduced stregthen the Eysenkian position that neuroticism and manifest anxiety bear considerable similarity to each other, and that the concept of extraversion provides an additional useful avenue of approach to the study of personality.

The comparative effects of physiological versus psychological stress upon the Rorschach responses of similar neuroticism-extraversion groups could be investigated in future research. Factors having to do with the subjects themselves, such as sex and intellectual ability could also be related to Rorschach performance.

Controlling for the influence of stress outside the experiment proper presents a perplexing difficulty for research of this nature. Tighter screening of the experimental subjects than that employed in the present investigation might be of assistance, but is probably of limited usefulness.

Two main conclusions may be drawn from the present research. First, Rorschach variables did not distinguish between high and low neuroticism and high and low extraversion groups. Inability to control for extra-experimental stresses imply that the procedures employed did not constitute a critical test of the null hypotheses for this aspect

of the research. Second, Rorschach variables were sensitive to the introduction of psychological stress. The changes which occurred in the groups provide moderate support for the retention of neuroticism and extraversion in the continuing study of personality.

BIBLIOGRAPHY

Eysenck, H. J., Dimensions of Personality, London, Kegan Paul, 1947, xi-308 p.

A report of research leading to the description of the personality dimensions of neuroticism and extraversion. Based on factor analytic methods for the assessment of objective data, this book is largely descriptive, without providing theoretical structure.

Eysenck, H. J., "A Dynamic Theory of Anxiety and Hysteria", Journal of Mental Science, Volume 101, No. 422, 1955, p. 28-51.

An exposition of the theoretical bases of neuroticism and extraversion in relationship to learning theory and personality theory. The suggestion herein that psychological as well as physiological variables be investigated led to the initiation of the present research.

Schwartz, Fred and Solis L. Kates, Rorschach Performance, Anxiety Level, and Stress", Journal of Projective Techniques, Vol. 21, No. 2, June 1957, p. 154-160.

A report of research on psychological stress and its effect on subjects with high and low manifest anxiety scores. As in the present study, changes in Rorschach variables were used to measure the effects of stress and personality variables. Their results were interpreted as supporting the concept of manifest anxiety in the study of personality.

Schwartz, Fred and Solis L. Kates, "Behn-Rorschach and Rorschach Under Standard and Stress Conditions", Journal of Consulting Psychology, Vol. 21, No. 4, August 1957, p. 335-338.

Evidence is presented that the Rorschach and Behn-Rorschach are sufficiently similar to be used as alternate forms for research purposes, and that both inkblot tests are sensitive to experimental psychological stress.

APPENDIX 1

M.P.I. SCORES AND AGES OF SUBJECTS COMPRISING THE EXPERIMENTAL GROUPS

Table V.-M.P.I. Scores and Ages of Subjects Composing the Experimental Groups

Group	M.P.I. Scores N	E	?	Age
Lo N-Lo E				
Subject				
30	14	16	2	20.83
45	2	24	0	20.08
56	6	16	0	20.50
57	14	19	1	20.00
84	12	24	2	20.17
130	12	20	0	22.42
133	14	21	1	20.08
152	14	23	3	20.67
Lo N-Hi E				
Subject				
1	4	40	0	20.75
5	10	38	0	21.50
22	10	46	0	20.33
23	4	38	0	20.50
43	7	40	1	21.08
119	7	38	3	20.25
148	8	43	1	20.42
153	12	42	0	21.08
Hi N-Lo E				
Subject				
33	32	14	2	21.17
37	34	13	1	19.75
67	40	21	1	19.83
70	36	20	2	20.25
103	33	20	6	20.67
107	38	9	3	21.00
128	32	14	0	21.25
142	38	8	0	20.25
Hi N-Hi E				
Subject				
50	35	36	5	20.50
53	36	38	0	22.67
71	30	48	0	20.25
92	32	46	0	20.83
114	29	40	1	22.42
129	34	38	2	22.83
139	28	46	4	20.42
149	36	42	2	20.83

APPENDIX 2

TABLES PRESENTING MEANS AND t VALUES FOR THE FOUR GROUPS IN THE NEUROTICISM AND EXTRAVERSION DIMENSIONS

Table VI.-Means and t Values for the Comparison of the Four Groups With Respect to the Neuroticism Dimension

	Mean	t
Lo N-Lo E versus Lo N-Hi E	11.00 7.75	.60
Lo N-Lo E versus Hi N-Lo E	11.00 35.38	4.45[a]
Lo N-Lo E versus Hi N-Hi E	11.00 32.50	3.87
Lo N-Hi E versus Hi N-Lo E	7.75 35.38	6.58
Lo N-Hi E versus Hi N-Hi E	7.75 35.38	5.75
Hi N-Hi E versus Hi N-Lo E	32.50 35.38	.65

[a] Single underlining designates a $p \leq .01$.

APPENDIX 2

Table VII.-Means and t Values for the Comparison of the Four Groups With Respect to the Extraversion Dimension

	Mean	t
Lo N-Lo E versus Lo N-Hi E	20.48 40.63	4.73[a]
Lo N-Lo E versus Hi N-Lo E	20.48 14.88	.94
Lo N-Lo E versus Hi N-Hi E	20.48 41.00	3.72
Lo N-Hi E versus Hi N-Lo E	40.63 14.88	4.45
Lo N-Hi E versus Hi N-Hi E	40.63 41.00	.07
Hi N-Hi E versus Hi N-Lo E	41.00 14.88	3.89

a Single underlining designates a $p \leq .01$.

APPENDIX 3

SAMPLE OF PERSONALITY EVALUATION GIVEN TO INDUCE SELF-ESTEEM STRESS

APPENDIX 3

Jane Doe:

An analysis of your Rorschach and other test data indicates that you are an anxious person who is considerably concerned over your felt inadequacies. You have the feeling that you are inferior to others in intellectual capacities. When you compare yourself to others in this respect, you find yourself lacking to a considerable extent.

You have a tendency to find emotional relationships with other persons quite disconcerting. Instead of remaining objective and rational you are prone to become emotionally involved in your contacts with others. Often, you avoid others because of some inexplicable dislike, on your part. You sometimes manifest almost chronic apprehension with respect to the future which you feel may bring disastrous consequences. You are apt to become unreasonably distressed over failures instead of taking them in your stride. You have a distinct need to have other people like and admire you but you often feel that an insufficient amount of attention is given you. Your sexual adjustment is a definite problem which appears difficult to resolve. Although you may appear self-controlled outside, you tend to be insecure and emotional inside. Much of the time you have serious doubts as to whether you have made the right decision or have done the right things. Some of your wishes are a bit unrealistic. You are prone to do a great deal of day-dreaming which is rarely put into concrete achievement. You are afraid to volunteer for any activities because you fear failure and ridicule, although, of course, you rationalize these fears. At times, you find it most difficult to concentrate upon the tasks at hand. You appear to be hypersensitive to many minor distractions.

In summary, yours is a personality that manifests considerable insecurity, a rather marked degree of anxiety, a fantasy life that is not too close to reality, much vacillation and doubt over your conduct of affairs, with many deep-seated feelings of inadequacy and inferiority.

Virginia E. Schoen, M.A.

sm

APPENDIX 4

SUMMARY OF THE ANALYSES OF VARIANCE FOR FIFTEEN SELECTED RORSCHACH VARIABLES BY NEUROTICISM AND STRESS.

Table VIII.-Summary of the Analysis of Variance for Rorschach Variable W by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	710.72	30	23.69	
Neuroticism	0.77	1	0.77	0.03
Stress	70.14	1	70.14	22.63[a]
N by S	0.39	1	0.39	0.13
Remainder	92.97	30	3.10	

a Double underlining designates a $p \leq .01$.

Table IX.-Summary of the Analysis of Variance for Rorschach Variable D by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	485.69	30	16.19	
Neuroticism	14.06	1	14.06	0.87
Stress	27.56	1	27.56	6.77[a]
N by S	2.25	1	2.25	0.55
Remainder	122.19	30	4.07	

a Single underlining designates a $p \leq .05$.

Table X.-Summary of Analysis of Variance for Rorschach Variable d by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	69.38	30	2.31	
Neuroticism	0.06	1	0.06	0.03
Stress	5.06	1	5.06	4.69[a]
N by S	0.56	1	0.56	0.52
Remainder	32.38	30	1.08	

a Single underlining designates a $p \leq .05$.

Table XI.-Summary of the Analysis of Variance for Rorschach Variable DdS by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	173.22	30	5.77	
Neuroticism	9.77	1	9.77	1.69
Stress	0.77	1	0.77	0.20
N by S	1.89	1	1.89	0.49
Remainder	115.77	30	3.86	

Table XII.-Summary of the Analysis of Variance for Rorschach Variable F by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	519.97	30	17.33	
Neuroticism	4.52	1	4.52	0.26
Stress	3.52	1	3.52	0.58
N by S	0.39	1	0.39	0.06
Remainder	182.59	30	6.09	

Table XIII.-Summary of the Analysis of Variance for Rorschach Variable M by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	155.44	30	5.18	
Neuroticism	4.00	1	4.00	0.77
Stress	9.00	1	9.00	1.90
N by S	3.06	1	3.06	0.65
Remainder	141.94	30	4.73	

Table XIV.-Summary of the Analysis of Variance for Rorschach Variable FM by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	354.44	30	11.81	
Neuroticism	9.00	1	9.00	0.76
Stress	1.56	1	1.56	0.21
N by S	0.25	1	0.25	0.03
Remainder	218.19	30	7.27	

Table XV.-Summary of the Analysis of Variance for Rorschach Variable m by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	27.97	30	0.93	
Neuroticism	1.89	1	1.89	2.03
Stress	0.02	1	0.02	0.02
N by S	0.77	1	0.77	0.93
Remainder	24.72	30	0.82	

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Table XVI.-Summary of the Analysis of Variance for Rorschach Variable Color by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	142.88	30	4.76	
Neuroticism	0.06	1	0.06	.01
Stress	6.25	1	6.25	3.24
N by S	1.00	1	1.00	0.52
Remainder	57.75	30	1.93	

Table XVII.-Summary of the Analysis of Variance for Rorschach Variable FSh by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	136.34	30	4.54	
Neuroticism	1.89	1	1.89	0.42
Stress	8.27	1	8.27	1.95
N by S	0.14	1	0.14	0.05
Remainder	84.09	30	2.80	

Table XVIII.-Summary of Analysis of Variance for Rorschach Variable ShF by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	57.34	30	1.91	
Neuroticism	9.77	1	9.77	5.11[a]
Stress	0.39	1	0.39	0.53
N by S	0.02	1	0.02	0.03
Remainder	22.09	30	0.74	

a Single underlining designate a $p \leq .05$.

Table XIX.-Summary of the Analysis of Variance for Rorschach Variable Shading by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	186.68	30	6.22	
Neuroticism	3.06	1	3.06	0.49
Stress	12.25	1	12.25	4.39[a]
N by S	0.06	1	0.06	0.02
Remainder	83.69	30	2.79	

a Single underlining designates a $p \leq .05$.

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Table XX.-Summary of the Analysis of Variance for Rorschach Variable Reaction Time by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	569913.00	30	18997.10	
Neuroticism	4761.00	1	4761.00	0.25
Stress	89102.25	1	89102.25	13.12[a]
N by S	225.00	1	225.00	0.03
Remainder	203744.75	30	6791.49	

a Double underlining designates a $p \leq .01$.

Table XXI.-Summary of the Analysis of Variance for Rorschach Variable Forced Responses by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	285.19	30	9.51	
Neuroticism	0.56	1	0.56	.06
Stress	33.06	1	33.06	6.25[a]
N by S	0.25	1	0.25	0.05
Remainder	158.69	30	5.29	

a Single underlining designates a $p \leq .05$.

Table XXII.-Summary of the Analysis of Variance for Rorschach Variable Minus Form Level by Neuroticism and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	138.47	30	4.62	
Neuroticism	1.27	1	1.27	0.27
Stress	1.89	1	1.89	1.12
N by S	0.02	1	0.02	0.01
Remainder	50.59	30	1.67	

APPENDIX 5

SUMMARY OF THE ANALYSES OF VARIANCE FOR FIFTEEN SELECTED RORSCHACH VARIABLES BY EXTRAVERSION AND STRESS

Table XXIII.-Summary of the Analysis of Variance for Rorschach Variable W by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	709.59	30	23.65	
Extraversion	1.89	1	1.89	.08
Stress	70.14	1	70.14	22.57[a]
E by S	0.14	1	0.14	0.05
Remainder	93.11	30	3.11	

a Double underlining designates a $p \leq .01$.

Table XXIV.-Summary of the Analysis of Variance for Rorschach Variable D by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	498.19	30	16.61	
Extraversion	1.56	1	1.56	.09
Stress	27.56	1	27.56	6.99[a]
E by S	6.25	1	6.25	1.59
Remainder	118.19	30	3.94	

a Single underlining designates a $p \leq .05$.

APPENDIX 5

Table XXV.-Summary of the Analysis of Variance for Rorschach Variable d by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	69.38	30	2.31	
Extraversion	0.00	1	____	____
Stress	5.06	1	5.06	4.60[a]
E by S	____	1	____	____
Remainder	33.00	30	1.10	

a Single underlining designates a $p \leq .05$.

Table XXVI.-Summary of the Analysis of Variance for Rorschach Variable DdS by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	176.09	30	5.87	
Extraversion	6.89	1	6.89	1.17
Stress	0.77	1	0.77	0.20
E by S	4.52	1	4.52	1.20
Remainder	113.22	30	3.77	

Table XXVII.-Summary of the Analysis of Variance for Rorschach Variable F by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	523.22	30	17.44	
Extraversion	1.27	1	1.27	0.07
Stress	3.52	1	3.52	0.60
E by S	6.89	1	6.89	1.17
Remainder	176.09	30	5.87	

Table XXVIII.-Summary of the Analysis of Variance for Rorschach Variable M by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	159.19	30	5.31	
Extraversion	0.25	1	0.25	0.05
Stress	9.00	1	9.00	1.87
E by S	0.56	1	0.56	0.12
Remainder	144.44	30	4.81	

APPENDIX 5

Table XXIX.-Summary of the Analysis of Variance for Rorschach Variable FM by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	361.88	30	12.06	
Extraversion	1.56	1	1.56	0.13
Stress	1.56	1	1.56	0.21
E by S	0.06	1	0.06	0.01
Remainder	218.38	30	7.28	

Table XXX.-Summary of the Analysis of Variance for Rorschach Variable m by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	29.47	30	0.98	
Extraversion	0.39	1	0.39	0.40
Stress	0.02	1	0.02	0.20
E by S	0.14	1	0.14	0.20
Remainder	25.34	30	0.84	

Table XXXI.-Summary of the Analysis of Variance for Rorschach Variable Color by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	142.88	30	4.76	
Extraversion	0.06	1	0.06	.01
Stress	6.25	1	6.25	3.19
E by S	0.00	1	____	____
Remainder	58.75	30	1.96	

Table XXXII.-Summary of the Analysis of Variance for Rorschach Variable FSh by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	136.34	30	4.54	
Extraversion	0.02	1	0.02	0.003
Stress	8.27	1	8.27	2.97
E by S	2.64	1	2.64	0.95
Remainder	83.47	30	2.78	

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Table XXXIII.-Summary of the Analysis of Variance for Rorschach Variable ShF by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	57.34	30	1.91	
Extraversion	0.39	1	0.39	0.20
Stress	0.39	1	0.39	0.37
E by S	0.02	1	0.02	0.02
Remainder	31.47	30	1.05	

Table XXXIV.-Summary of the Analysis of Variance for Rorschach Variable Shading by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	189.19	30	6.33	
Extraversion	0.56	1	0.56	.09
Stress	12.25	1	12.25	4.55[a]
E by S	3.06	1	3.06	1.14
Remainder	80.69	30	2.69	

a Single underlining designates a $p \leq .05$.

Table XXXV.-Summary of the Analysis of Variance for Rorschach Variable Reaction Time by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	574673.00	30	19155.77	
Extraversion	1.00	1	1.00	.00005
Stress	89102.25	1	89102.25	13.65[a]
E by S	8100.00	1	8100.00	1.24
Remainder	195869.75	30	6528.99	

a Double underlining designates a $p \leq .01$.

Table XXXVI.-Summary of the Analysis of Variance for Rorschach Variable Forced Responses by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	279.50	30	9.32	
Extraversion	6.25	1	6.25	0.67
Stress	33.06	1	33.06	6.55[a]
E by S	7.56	1	7.56	1.50
Remainder	151.38	30	5.05	

a Single underlining designates a $p \leq .05$.

Table XXXVII.-Summary of the Analysis of Variance for Rorschach Variable Minus Form Level by Extraversion and Stress

Source of Variation	Sum of Squares	df	Estimate of Variance	F
Individuals	135.22	30	4.51	
Extraversion	4.52	1	4.52	1.00
Stress	1.89	1	1.89	1.12
E by S	0.14	1	0.14	0.08
Remainder	50.47	30	1.68	

APPENDIX 6

MEANS AND STANDARD DEVIATIONS OF THE FIFTEEN RORSCHACH VARIABLE FOR THE FOUR GROUPS ON THE FIRST AND SECOND TEST ADMINISTRATIONS

Table XXXVIII.-Means and Standard Deviations of the Fifteen Rorschach Variables for the Four Groups on the First and Second Test Administration

Variable		Group							
		Lo N-Lo E		Lo N-Hi E		Hi N-Lo E		Hi N-Hi E	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
W	Test 1	7.375	3.805	7.125	3.257	7.000	3.640	6.750	2.773
	Test 2	5.625	4.091	4.375	2.643	4.750	4.265	5.125	3.407
D	Test 1	10.750	3.345	9.000	3.082	10.500	2.958	10.375	2.955
	Test 2	11.000	3.082	10.625	3.638	11.625	2.690	12.625	2.395
d	Test 1	1.125	1.053	.875	1.053	1.125	.927	1.375	.992
	Test 2	1.375	1.218	2.125	1.615	2.000	1.732	1.250	.968
DdS	Test 1	2.750	1.561	5.000	2.958	3.375	1.728	3.500	1.500
	Test 2	4.000	1.581	4.875	2.977	3.625	1.996	3.000	1.118
F	Test 1	6.750	3.345	5.500	4.183	5.750	2.437	5.125	3.257
	Test 2	7.500	2.828	5.375	3.462	4.625	2.118	7.500	3.279
M	Test 1	2.125	1.269	2.000	1.323	2.875	1.364	3.125	1.536
	Test 2	2.875	2.619	3.625	3.533	4.000	2.450	2.625	1.728
FM	Test 1	5.375	2.118	5.250	3.269	5.875	3.370	6.500	2.828
	Test 2	5.250	3.152	6.250	3.152	6.500	3.775	6.250	1.479
m	Test 1	.875	.781	1.125	1.053	.625	.696	.250	.661
	Test 2	.875	1.111	.625	.696	.750	.829	.500	1.000
Color	Test 1	2.750	1.199	3.125	1.965	2.875	2.421	2.625	1.867
	Test 2	1.500	1.414	2.625	1.654	2.875	1.763	1.875	1.166

Table XXXVIII.-(Continued)

Variable		Group: Lo N-Lo E Mean	Lo N-Lo E SD	Lo N-Hi E Mean	Lo N-Hi E SD	Hi N-Lo E Mean	Hi N-Lo E SD	Hi N-Hi E Mean	Hi N-Hi E SD
FSh	Test 1	3.250	1.714	3.750	2.107	3.750	1.639	4.125	2.472
	Test 2	3.250	1.854	2.500	1.414	3.125	1.763	3.125	1.536
ShF	Test 1	.875	1.269	1.250	1.639	.250	.433	.250	.433
	Test 2	.750	.968	1.000	2.000	.125	.331	.125	.331
Shading	Test 1	4.125	2.088	5.000	1.180	4.000	1.500	4.375	2.176
	Test 2	4.000	2.550	3.500	2.121	3.250	1.714	3.250	1.785
R.T.	Test 1	15.863	4.661	13.525	7.724	13.450	4.034	20.188	13.277
	Test 2	24.538	13.117	20.675	9.161	24.300	11.037	23.513	16.814
Forced Responses	Test 1	4.125	2.934	3.750	1.392	2.625	2.342	2.875	1.269
	Test 2	4.250	2.488	5.000	3.419	4.000	1.803	4.625	3.498
Minus Form Level	Test 1	2.125	1.452	2.750	1.854	2.750	2.088	1.375	.992
	Test 2	2.250	1.714	1.875	.781	2.250	2.278	1.375	1.495

APPENDIX 7

ABSTRACT OF

A STUDY OF THE RELATIONSHIPS BETWEEN SELECTED RORSCHACH VARIABLES AND NEUROTICISM AND EXTRAVERSION

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ABSTRACT OF

A STUDY OF THE RELATIONSHIPS BETWEEN SELECTED RORSCHACH VARIABLES AND NEUROTICISM AND EXTRAVERSION[1]

The present research has been an effort in the investigation of the personality variables of neuroticism and extraversion within the framework of an established clinical technique. In the review of the literature the use of the inkblot test and stress as methods for the investigation of personality variables was discussed. The hypothesized relationship between neuroticism and manifest anxiety was noted, with the suggestion that the addition of the extraversion variable might yield information pertinent to personality theory.

Eight subjects were selected for each of four experimental groups from a total of 170 student nurse volunteers. Subjects were chosen on the basis of scores they had obtained on the Maudsley Personality Inventory, with each experimental group representing extremes of neuroticism and extraversion. Psychological stress was introduced by giving each subject a threatening personality evaluation. The effects of psychological stress was assessed by use of the Rorschach and

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1 Gloria L. Fellers, Doctoral thesis presented to the School of Psychology and Education, University of Ottawa, October 1963, 1-76 p.

Behn-Rorschach inkblot tests, administered in counterbalanced fashion. The threatening personality evaluation and second inkblot test were administered in not less than seven nor more than fourteen days after the first inkblot test was administered.

Results of the analyses of variances for fifteen selected Rorschach variables indicated that the four neuroticism-extraversion groups could not be differentiated from each other. Since stress outside the experiment could not be controlled, a critical test of the theory cannot be assumed. Six of the fifteen Rorschach variables were sensitive to experimental psychological stress. The changes which occurred in the four groups suggested that the variables of neuroticism and extraversion are of some value in the study of personality, providing moderate support for the underlying theory.