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The adequacy of inkblots as a technique for characterizing individuals.

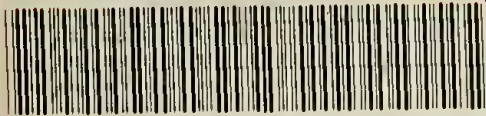
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THE ADEQUACY OF INKBLOTS
AS A TECHNIQUE FOR CHARACTERIZING INDIVIDUALS

TANOFSKY - 1954

THE ADEQUACY OF INKBLOTS
AS A TECHNIQUE FOR CHARACTERIZING INDIVIDUALS

By
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THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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INTRODUCTION

Theoretical and Experimental Background

The current interest in projective techniques as a method for studying personality stems from the idea that one's perception of an ambiguous stimulus reflects his personality. This principle has been incorporated in the development of projective techniques which are at present widely used as a measure of personality by the Clinician. Bruner explains the concept of perception as a measure of personality by saying: "What we study in most perceptual experiments is the extent to which the subject is able to maximize relevant cues (defined by the experimenter) for confirming and/or infirming hypotheses. This maximization depends upon the kind and strength of the hypotheses which he employs in his perception of a situation" (6, p. 132).

The experimental evidence in the fields of perception consistently suggests some degree of selectivity in all perceptual processes (7,8,10,17). One may assume as pointed out by Abt, that "the general selectivity found in all perceptual acts of the individual is caused by, or more properly is a function of, certain internal and external factors of perception which operate in lawful ways" (1, p. 47). Abt considers the "external factors" to be a function of the stimulus field and the "internal factors" to be a function

of the needs, motives, and other factors not characteristic of the stimulus already present. Thus, "the more structured the stimulus field, the more dependent behavior usually is upon the operation of the external factors in perception; and, conversely, the greater the vagueness and ambiguity of the stimulus field, the greater the opportunity for and need of internal factors in perception to operate" (1, p. 50). Consequently, much of the work in the field of perception and personality is done with "ambiguous stimuli", e.g. dimly illuminated pictures or words, rapidly exposed materials, ambiguous drawings, relatively unstructured forms, etc. The revealing of individual needs by the perception of ambiguous stimuli is basic to the use of projective techniques (5). The projective technique uses a stimulus that is quite unstructured, "if possible, one so novel that the subject can bring to it no specific knowledge of how to respond" (11, p. 433).

Projection, as originally defined by Freud, is a defense mechanism (2). In the Freudian sense, a person is projecting when he ascribes to another person a trait or desire of his own that would be painful for his ego to acknowledge. The common elements of the psychoanalytic definitions are that: the process of projection is unconscious, it serves as a defense against unconscious impulses, feelings, ideas, and finally it reduces personal tension. Projective materials,

however, have been found effective in revealing consciously recognized materials. Also, projection as a defense mechanism is only one kind of mental mechanism that projective techniques are designed to elicit. Bell defines the term projection as follows: "Projection means to cast forward, which is the action involved in the techniques. The subject manifests his personality in them by thrusting it out where it may be inspected. In the throwing, the personality is not grossly modified; it is only externalized in behavior that is typical of the individual" (4, pp. 3-4). The current rationale behind projective techniques may be more clearly understood by quoting from Anderson who says that projective techniques "elicit not only projections, but also expressions of almost all other conceivable kinds of mental mechanisms and symbols of human relationships. Projective tests are, in fact, not strictly tests of projection but tests of mental mechanisms or of personality dynamisms including projection" (2, p. 3).

The use of inkblots as a projective technique for personality diagnosis began with the efforts of the Swiss psychiatrist, Hermann Rorschach (20), to discover a practical and simple method of differential diagnosis. His investigations were started in 1911 and culminated in 1921 with the publication of his book, Psychodiagnostics. Although Rorschach was the first to develop a technique for using

inkblots in personality diagnosis, many experimenters used them for other purposes both before and after his research. Kerner (4), in 1857, noticed the way in which different inkblots assumed shapes which could be related to various scenes. Rosenzweig (21) cites a juvenile book, published in 1896, which described a game that utilized inkblots as a basis for inducing fantasy. Binet and Henri (24), in an article published in 1895, suggested that a series of inkblots might be used for investigating visual imagination. Dearborn (24), in 1898, reported results on inkblots in an investigation of content of consciousness, memory, reaction time, and after-images.

Although several investigators prior to Rorschach used inkblots to study imagination (4,24), Rorschach refers to only one study in his book (20). The study was one carried out in Switzerland, in 1916, by Hens (14) under the supervision of Bleuler, and consisted of obtaining the responses of 1000 school children, 100 normal adults, and 100 patients of varied diagnosis, to eight black and white inkblots. Interpretations were made from the content, although location and relation of detail were taken into consideration.

The publication of Rorschach's ten inkblots, in 1921, provoked a great number of studies (4). Behn (9) and Harrower-Erickson (4) have published alternate forms of the test materials. William Stern (4) felt that cloud pictures

were more valuable for projection than Rorschach's inkblots, and advised Struve (4) to develop a series of cloud pictures. Struve's pictures were intended to act as meaningless visual stimuli. Retaining the Struve pictures, Stern improved the method with the aim of giving it standard form.

More recently, studies employing original inkblots were carried out by Smith (23) and by Siipola, et. al. (22). Both studies investigated color in inkblots. The former investigator found that the acquisition of nonsense syllable responses occurred less readily to red than to grey inkblots. Siipola, et. al. found no significant difference between the reaction time to chromatic and achromatic inkblots.

Although the Rorschach inkblots have proven to be helpful in revealing information about normals, and have proven to be of value diagnostically, Rorschach (20) and many other investigators (3,12,15,18,19) have pointed out the necessity for fundamental research with inkblots in general. To date little of such research has occurred, most workers being content to accept Rorschach's initial hypotheses on faith. Hertz states: "Despite the rapid progress in the field, the impressiveness of research and the accumulation of valuable data, the scientific validity of the method is still open to challenge. Many of the limitations have already been discussed -- overgeneralization, conclusions drawn from small groups and from preliminary observations, the uncritical

lumping of Rorschach data, lack of statistical treatment of statistical problems. More may be said. Research has not kept up with therapeutic usage; subjective interpretation has outrun scientific judgment. Doctrinaire inflexibility has characterized much of the work on the refinement and development of the method and much of its clinical validation. These shortcomings are serious because they surround the method with an aura of mystery. Much that has been offered has not been or cannot be explained, or it can be applied only by a chosen few" (15, p. 73).

Statement of the Problem

Since Rorschach's work is based largely on clinical intuition rather than on principles of test design or well controlled experimentation, it would be surprising if his technique were the best possible type of inkblot test of personality. He did not determine, for example, whether an open ended test (where the total number of responses is variable) is superior to a closed method (where the total number of responses is held constant), despite the difficulty with the former type of test in determining how much a factor varies independently of total number of responses. Another matter to be considered is the construction of the stimulus cards. Rorschach emphasized the importance of color as a characteristic measure, however his set of cards consists of only three fully colored blots, two blots that include red

and black, and five achromatic blots. If color is an important score, might it not be better to utilize a set of cards which afford an opportunity for sampling color responses on all cards rather than on a few? Ten items dealing with color, all other factors being equal, should give more reliable results than three. In spite of these limitations, there have been wide claims of clinical success with the Rorschach method. The success, however, has not been experimentally substantiated, due in part, perhaps, to the difficulties of statistical validation. Since inkblots have been demonstrated to be useful clinically, it would be desirable to construct cards which are more amenable to statistical and experimental research.

In considering personality measurement one might think in terms of characteristics which consistently differentiate one individual from a group of individuals. To illustrate, height is characteristic of an individual since one individual has a constant height, whereas other individuals have different heights. It is the lack of variability in an individual's height relative to the variability in the height of others which enables height to characterize him. There is little evidence, however, that height characterizes an individual in a way related to personality. Inkblot perceptions, on the other hand, have been widely used as measures of per-

sonality. Therefore, if inkblots (or any other technique) are to be used as effective and objective measures of personality, it is necessary (a) to determine what kinds of responses to them, if any, are apt to characterize an individual, and (b) to relate these kinds of responses to personality traits.

The present study undertakes the first step by determining which, if any, responses to inkblots consistently measure individual differences on ten administrations over a period of five weeks. This investigation has an advantage over the usual two-test reliability study in that it is more intensive and allows for the control and evaluation of variance due to the combined effect of sets and sessions.

EXPERIMENTAL METHOD

Subjects

Eight volunteer male and eight volunteer female college sophomores enrolled in the Introductory Psychology course at the University of Massachusetts served as subjects. All subjects were naive with respect to the Rorschach technique and the purpose of the study. Since this was predominantly a study of individuals and not sexes no attempt was made to match the males and females.

Materials and Apparatus

The materials consisted of 100 inkblot stimulus cards divided into ten sets, each set containing ten cards. The cards were so designed that each could elicit several color and non-color responses. Accordingly, each card consisted of a large achromatic and a large chromatic blot, around both of which was a smaller colored and non-colored blot. (Figure 1). Every card contained the same number of blots and all were roughly equated for structure and color. Each set consisted of five cards with a black blot on top and a colored blot below alternated with five other cards in which the reverse was true. Cards were randomly assigned to sets. Thus, all sets were approximately equal.

The blots were made on 5" x 8" index cards ruled off so



Figure 1.

Example of inkblot used in the study.

that the blot area could not exceed 5" x 6". The cards were then folded in half, lengthwise, and a drop of black ink was placed near the center fold, either on top or bottom of the 5" x 6" card area, and the card was folded again. Frequently, more drops of black ink were added in an attempt to increase complexity. In the same fashion the main colored blot was produced, but two additional drops of ink were always added so that it was composed of three different colors. There were four possible combinations of three colors. A fourth color was used to make a small separate blot beside the main black blot, and another small drop of black ink was used to make a small separate blot beside the main colored blot. Red, green, brown, and blue standard pen ink and black India ink were used.

Location sheets outlining the blots were traced on mimeograph stencils. (Appendix B). Response sheets also were mimeographed. (Appendix B). A 6" x 6" opaque projector was used to present the blots.

Procedure

The Ss were seated within a specified distance from the projector so that the projected stimulus would be the same for all. The room was lighted by two goose neck lamps which faced the wall in order to supply enough illumination to write.

The group of subjects responded to two sets of cards each week for a period of five weeks. There was a lapse of at least 48 hours or more between administrations. A brief explanation concerning the experiment was given before the first administration. (Appendix A). Each card was presented for three minutes and preceding every administration Ss were instructed to write three responses to each card and to identify these responses on the location sheets. The Ss were also instructed to indicate whether they saw the response in motion, about to move, or not moving, by checking the appropriate column on the response sheet. (Appendix A). The original intention of E had been to have a more detailed inquiry by requesting Ss to indicate what were the most important determinants of their responses. More specifically, they were to be asked the following:

Which of the following aspects of the blot made you see what you did? Place a check-mark in the appropriate column(s). If two or more characteristics entered, place two check-marks in the most important column and one in the next most important. Do not check more than two columns.

The columns were titled: chromatic color, achromatic color, and gradations in shading. Pretest revealed that the procedure was too time consuming and that Ss often misunderstood what they were to do. Thus, it was decided to drop the inquiry, except for those questions concerned with movement.

All in all, ten protocols were obtained from each of 16 Ss, making a total of 160 protocols of 30 responses each.

RESULTS

The protocols were scored by Klopfer's (16) technique, with revisions to make the scores applicable to the inkblots used. Responses to colored and non-colored areas of the cards, regardless of whether the responses themselves utilized the colors, were evaluated as a separate score because of their objectivity. Other scores included a measure of form-level adapted to the blots and Elizur's (13) anxiety and hostility content scores. All scores are summarized and described in Tables 1, 2, and 3. Objectivity of scoring was obtained by adhering closely to definitions of the terms. However, some problems did arise, for example, how to handle protocols in which S did not make three responses to every card. Since Ss were instructed to record three and only three percepts in each card and since most did see three things, it was decided to score the omitted responses as Rejects. (Seven people gave at least one rejection, but the number of rejections for each person averaged one or less per set). In line with Rorschach interpretation, rejections were considered as anxiety indicators and were given an anxiety weight of 2. This was the only modification of the Elizur technique. Another problem which arose concerned the scoring of movement, as Ss were not checking the columns appropri-

Table 1
Description of Location Scoring System

Score	Description
W	Responses to whole large achromatic and chromatic blots.
D	Responses to clearly delineated parts of large achromatic and chromatic blots.
dd	Responses to undifferentiated parts of large achromatic and chromatic blots.
w	Responses to whole small achromatic and chromatic blots.
d	Responses to parts of small achromatic and chromatic blots.
Chromatic	Responses to any chromatic area.
Achromatic	Responses to any achromatic area.
S	Responses to whole or parts of white spaces in chromatic or achromatic blots.

Table 2

Description of Determinant Scoring System

Score	Description	
M	Human percepts to which <u>S</u> attributes movement.	
FM	Animal percepts to which <u>S</u> attributes animal movement.	
m	Inanimate objects to which <u>S</u> attributes movement.	
F	Percepts which are determined by the form of the blot.	
FC	Percepts which are determined by definite form and color.	
CF	Percepts which are determined by color and indefinite form.	
C	Percepts which are determined by color only.	
ΣC	Sum of weighted color responses. Weights: 1.5-C, 1.0-CF, 0.5-FC.	
M:ΣC	Ratio of total human movement responses to sum of color responses per set.	
Form-level	Responses scored on a scale from 0 to +3.5 according to the extent to which the percept matches or fits the blot area used and the degree of elaboration of the percept.	
	Basal Score	
	No response - - - - -	0
	Vague or no form (cloud, explosion) - - - - -	1.0
	Definite but simple form (drop of water, flower) - - - - -	1.5
	Definite form (animal, human) - - - - -	2.0
	Additional Points	
	Movement- - - - -	+5
	Appropriate use of color- - - - -	+5
	Two or more things in one percept (if appropriate)- - - - -	+5
	People related- - - - -	+5
	Appropriate elaboration - - - - -	+5
	Inappropriate elaboration - - - - -	-5

Table 3
Description of Content Scoring System

Score	Description
H	Percepts which are human figures.
(H)	Percepts which are human figures but deprived of reality in some manner, e.g. drawings, ghosts, etc.
Hd	Percepts which are parts of human figures.
(Hd)	Percepts which are parts of human figures but deprived of reality.
A	Percepts which are animal figures.
(A)	Percepts which are animal figures but either deprived of reality or humanized, e.g. drawings, fairy tale animals.
Ad	Percepts which are parts of animals.
(Ad)	Percepts which are parts of animals but deprived of reality or humanized.
Anxiety	Those responses which reveal feelings or attitudes of fear, unpleasantness, sorrow, pity and the like are given anxiety scores, e.g. running rats, frail wings (13). "Rejections" are also scored as anxiety.
Hostility	Those responses which contain objects of aggression, hatred, dislike, criticism, derogation and the like are given hostility scores, e.g. spitting cats, gun (13).

ately. Therefore, movement was determined from the verbal elaboration of the responses and check-marks were considered only in questionable cases.

All scoring variables were tested by means of analysis of variance to determine whether significant individual differences occurred. (Table 4). Differences among Ss were found to be significant at beyond the .1% level of confidence for all scoring variables. Differences among sets were significant at beyond the .1% level for all location scores, except Space, but not for any of the determinant or content scores. Differences among sets were significant at beyond the 5% and 1% level for responses to chromatic and achromatic areas, respectively. Sessions and sets were confounded in the analysis. However, a lack of orderly change with sessions suggests that sets, rather than sessions, is the important variable. (Figure 2). Differences between sexes were significant for the combined A + (A) scores (the females scoring higher) at beyond the 1% level of confidence, but were not significant for any other score. No significance was found for the interaction of sex x sets. (Table 5).

Differences between sets, for most variables, accounted for a statistically non-significant degree of variance, whereas differences between individuals was always

Table 4
Design for All Analyses of Variance

Source	Sum of Squares	Degrees of Freedom	Mean Square	F
Sex		1	$\frac{SS}{df}$	$\frac{\text{Mean Sq. Sex}}{\text{Mean Sq. } \underline{Ss}}$
Subjects (Within Sex)		14	$\frac{SS}{df}$	$\frac{\text{Mean Sq. } \underline{Ss}}{\text{Mean Sq. Residual}}$
Sets		9	$\frac{SS}{df}$	$\frac{\text{Mean Sq. Sets}}{\text{Mean Sq. Residual}}$
Sex x Sets		9	$\frac{SS}{df}$	$\frac{\text{Mean Sq. Sex x Sets}}{\text{Mean Sq. Residual}}$
Residual (Error)		<u>126</u>	$\frac{SS}{df}$	
Total		159		

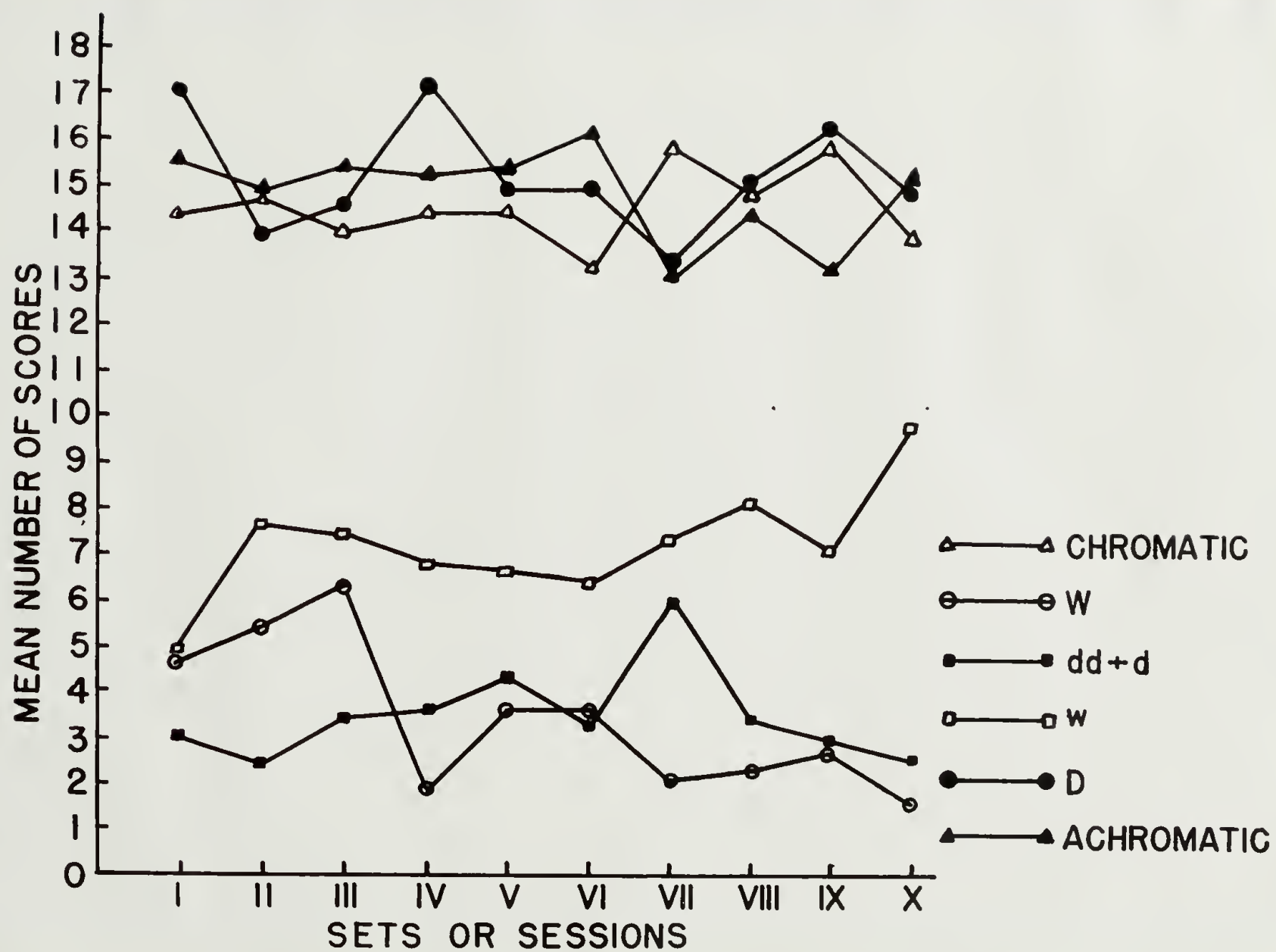


Figure 2.

Effect of practice on inkblot scores.

Table 5

Summary of Results from Analyses of Variance

	Score	F ratios			
		Sex	Subjects	Sets	Sex x Sets
Location	W	.419	7.49***	4.70***	.862
	D	.315	5.00***	3.18***	.477
	W	.025	6.31***	6.04***	.841
	dd + d	.069	8.33***	4.20***	.956
	Chromatic	1.78	4.56***	2.08**	1.61
	Achromatic	.974	4.91***	2.57***	1.36
	S	0	13.0***	1.49	.834
Determinant	M	.052	8.48***	.895	.552
	FM	1.72	4.39***	.913	.837
	m	.763	3.48***	1.21	.458
	FC	.747	3.79***	.977	.925
	CF + C	.34	4.64***	.641	.829
	ΣC	2.61	9.18***	.749	.912
	M:ΣC	4.44	7.65***	1.32	.770
	F	.447	8.23***	.758	.924
	Form-level	2.01	10.2***	1.51	.560
Content	H	.330	8.52***	.606	.905
	(H)	.031	5.36***	1.52	.978
	A + (A)	9.94**	6.74***	1.74	.655
	[Hd + Ad]				
	+	.098	6.67***	1.23	.886
	[(Hd) + (Ad)]				
	Anxiety	2.58	4.04***	.241	.766
	Hostility	1.51	6.47***	1.03	1.56

* Significant at beyond 5% level for appropriate df.
 ** Significant at beyond 1% level for appropriate df.
 *** Significant at beyond .1% level for appropriate df.

highly significant. Evaluation of sex differences, on the other hand, remains questionable since the groups were small, unmatched, and not randomly selected.

DISCUSSION

Ten sets of cards were utilized to ascertain whether individuals respond to inkblots in a consistent and characteristic fashion on successive administrations over a period of five weeks. The results indicate that all inkblot scores investigated consistently characterize individuals. These findings support the assumption that inkblot perceptions are highly effective in revealing individual differences. The investigation, however, does not indicate which scores, if any, are related to personality in a meaningful way. The next step, therefore, is to determine whether the scores are personality relevant. (In view of the fact that this study investigated an original set of inkblots, and not the Rorschach blots, one cannot generalize the results to the Rorschach cards. It would be of interest, however, to note the results of an experiment similar to the present study, utilizing inkblots designed like the Rorschach cards).

Within the range of the blots sampled, this study indicates that the determinant and content scores are influenced solely by the person responding, whereas the location scores are influenced, in addition, by the particular set of blots used. These results support the views expressed by Rorschach workers that the determinant scores are among the most

revealing aspects of inkblots. In addition, this study has demonstrated that content scores are as characteristic of individuals as determinant scores. This suggests that content scores may be worthy of more attention than they receive in standard Rorschach interpretation. Of particular interest is the lack of orderly change of the location scores from administration to administration. This finding suggests that significant differences among sessions are not a result of practice but of differences among the sets. The information concerning sex differences, on the other hand, is questionable. Significant differences between the groups of males and females were found for the animal content scores, only. Since Ss were volunteers, groups were unmatched, and number of Ss was relatively small, any conclusions concerning sex differences would be doubtful.

In conclusion, one can say that inkblot responses do measure individual differences. This conclusion, however, must be limited to the stimulus cards used in the present study. It is uncertain whether other sets of inkblots, including those constructed similar to the Rorschach cards, would be more or less effective than the present set in measuring individual differences. It would seem reasonable that ten items sampling color (as in the sets of inkblots used in this study) would give a more reliable measure of

response to color than would three to five items (as in the Rorschach set). Moreover, since a fixed number of responses was found to elicit revealing information, one questions the desirability of allowing total number of responses to vary (as is done in the Rorschach test), with all its attendant complications. (If the cards are constructed in a sufficiently complex manner there is no reason why people cannot be expected to give three responses per card. Their facility in responding would be determined by the quality rather than the quantity of their percepts.)

Implications for Further Work

This study has established that inkblot perceptions provide effective measures of individual differences, but has not determined whether these measures are meaningfully related to personality. Further work in the nature of validity studies would now appear warranted. The investigation also suggests that the Rorschach cards and/or procedure may not be the most effective inkblot technique. What is the best set of cards and procedure should be determined by experimentation. Some problems which require investigation are as follows:

1. Evaluation of the advantages of a closed-ended test vs. an open-ended test.
2. Comparison of sets of cards in which each card con-

tains color and sets in which only a few cards have color.

3. Determination of whether all cards in a set should be somewhat similar in form or considerably different in form.
4. Investigation of how many cards should be included in each set and how many responses, if any, should be required per card, i.e. What is the difference in results between one response to thirty cards and three responses to ten cards?

It would seem logical that the best set of inkblots would provide opportunity for all important Rorschach scores to occur (e.g. color, form, shading, movement, etc.) so that there would be maximum sampling of all factors in the limited set of items (i.e. cards) which characterizes inkblot techniques.

SUMMARY

The use of inkblots as a method for studying personality stems from the idea that one's perception of an ambiguous stimulus reflects his personality. More specifically, the Rorschach technique presupposes that responses to inkblots represent a stable dimension of an individual's behavior. The present study attempted to investigate this assumption by administering ten structurally equivalent sets of inkblots to eight male and eight female sophomores enrolled in an introductory psychology course.

Each inkblot stimulus card contained both a chromatic and achromatic inkblot and all cards were roughly equated as to color and structure. The 100 stimulus cards were randomly assigned to ten sets of ten cards each. Over a period of five weeks every S responded to all ten sets of inkblot cards administered in group form. A minimum of 48 hours elapsed between each session. The Ss were instructed to make three responses to every card and to identify their responses on location sheets. Each card was presented for three minutes. All in all, ten protocols of 30 responses each were obtained from every S, making a total of 160 protocols for the group as a whole.

The protocols were scored by a revised Klopfer tech-

nique. Form-level, Elizur's anxiety and hostility scores, and some new scores were considered. Analysis of variance of the scores revealed that all were highly significant in measuring stable individual differences. The analysis also indicated that there were significant differences in sets for all the location scores, except Space. Animal content scores were the only ones to elicit significant differences in the sex groups used, females giving more animal responses.

These results strongly support the use of inkblots as a measure of individual differences. The next step, however, is to determine what responses to inkblots are characteristic in a way related to personality. The study further suggests that the best set of inkblots to be used in the clinic should and can be experimentally determined.

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APPENDIX

Appendix A. Explanation of the Study and Instructions
Given to Ss.Explanation.

This investigation is concerned with the determination of what different people see in inkblots. It will be necessary to use a great many inkblots, and so ten sessions will be required. There will be two sessions each week for the next five weeks. At every session a series of inkblots will be presented and each of you will be requested to record what you see in the blots.

Instructions.

The inkblots will be projected on the screen and your task will be to write down what these inkblots, or any parts of them, resemble or look like to you. Make three responses to (any part of) each card and record the responses in the proper places on the paper which has been distributed. For example, for Card I, in the series, record the first thing you see in the place marked Card I, 1, for the second thing you see in the place marked Card I, 2, and in the same manner record the third response to Card I. The responses should be recorded in the same way for all the cards. Now look at the last column, answer the question as well as you can. Do not concern yourself with the other columns on the sheet.

After you have recorded your responses and answered the question concerning movement, indicate, on the location sheets which have been handed out, to what parts of the blots you have responded or where you saw your answers. Mark off the areas on the diagram of the inkblots as accurately as you can. For example, if you saw a cat's face in any part of the blot, circle that part of the blot and label it 1, 2, or 3.

You will see each card for three minutes. Before handing in the papers be sure your name is on them.

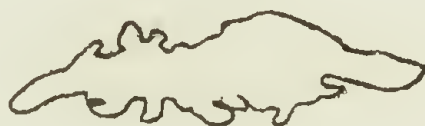
Appendix B.

Response Sheets and Location Sheets.

Date _____	Set _____	Name _____	Did you see it as life-like? If so, place a check-mark to indicate which of the following:		
Responses				Not moving	In motion or about to move
	<u>Card I</u>				
	1.				
	2.				
	3.				
<u>Card II</u>					
1.					
2.					
3.					
<u>Card III</u>					
1.					
2.					
3.					
<u>Card IV</u>					
1.					
2.					
3.					

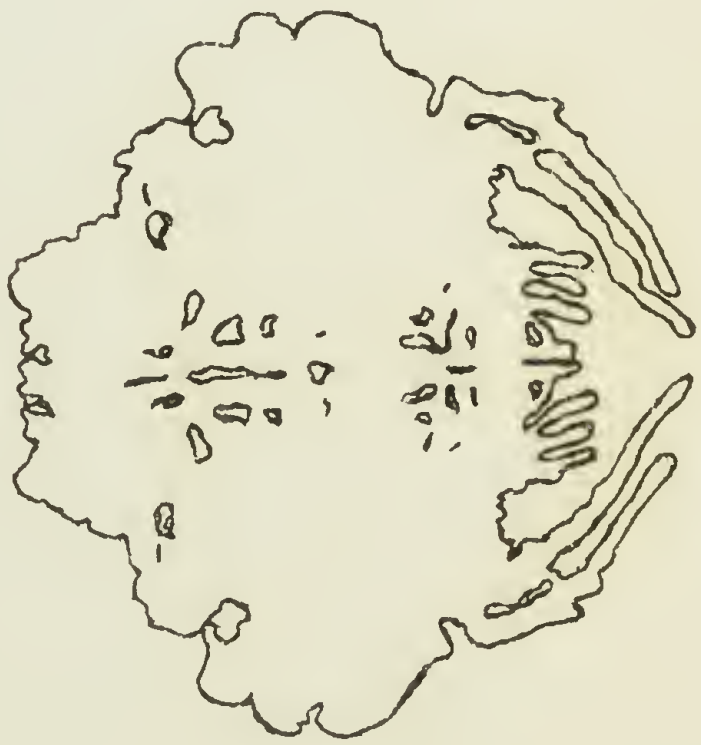
Date _____	Set _____	Name _____		
Responses			Not moving	In motion or about to move
<u>Card V</u>				
1.				
2.				
3.				
<u>Card VI</u>				
1.				
2.				
3.				
<u>Card VII</u>				
1.				
2.				
3.				
<u>Card VIII</u>				
1.				
2.				
3.				
<u>Card IX</u>				
1.				
2.				
3.				
<u>Card X</u>				
1.				
2.				
3.				

NAME _____

Set IV
CARD 2Set IV
CARD 1

NAME _____

Set IV
CARD 3



Set IV
CARD 4



NAME _____

Set IV
CARD 5

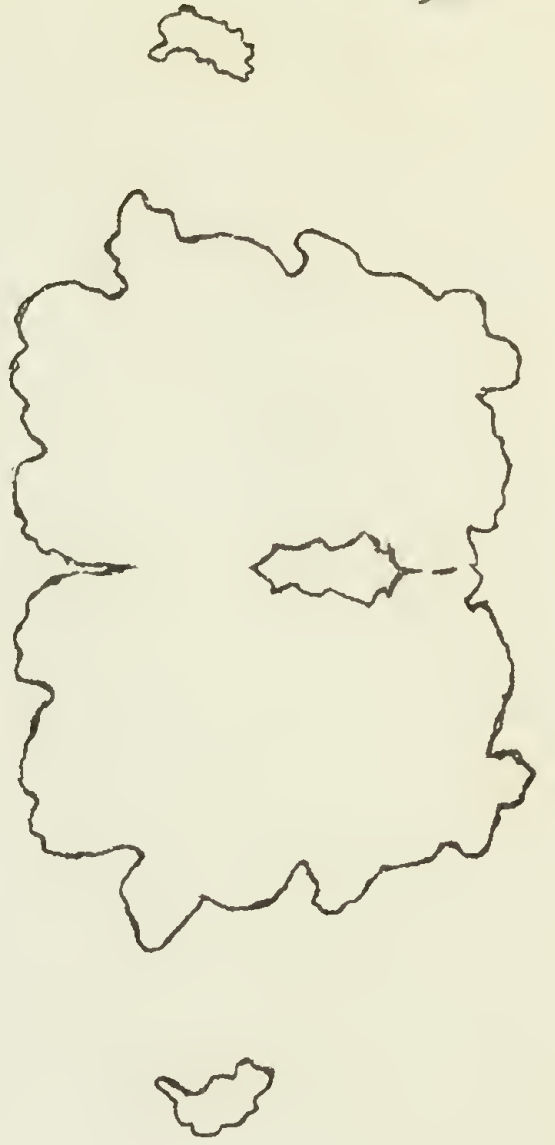


Set IV
CARD 6

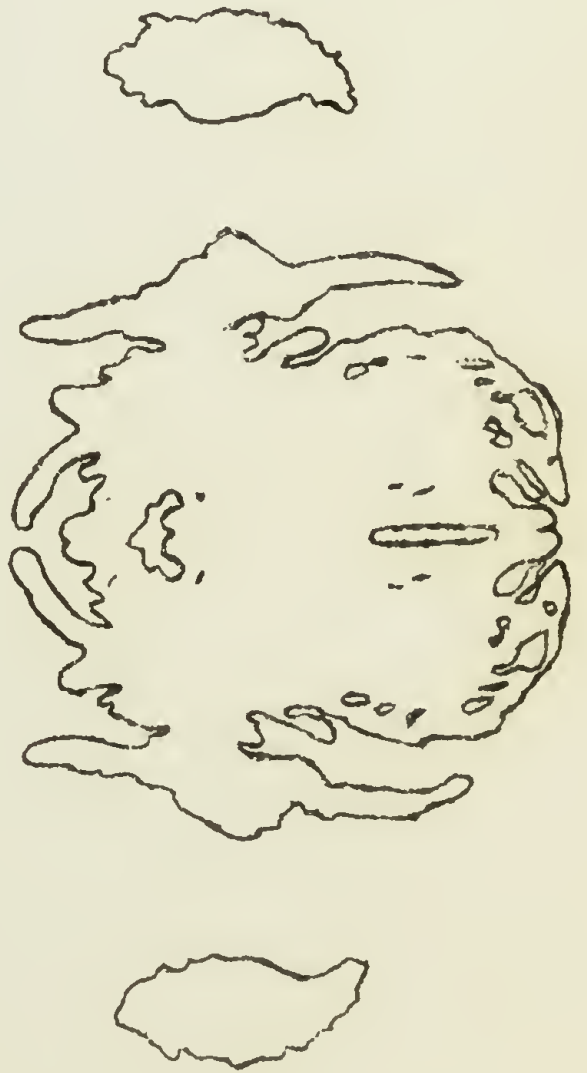


NAME _____

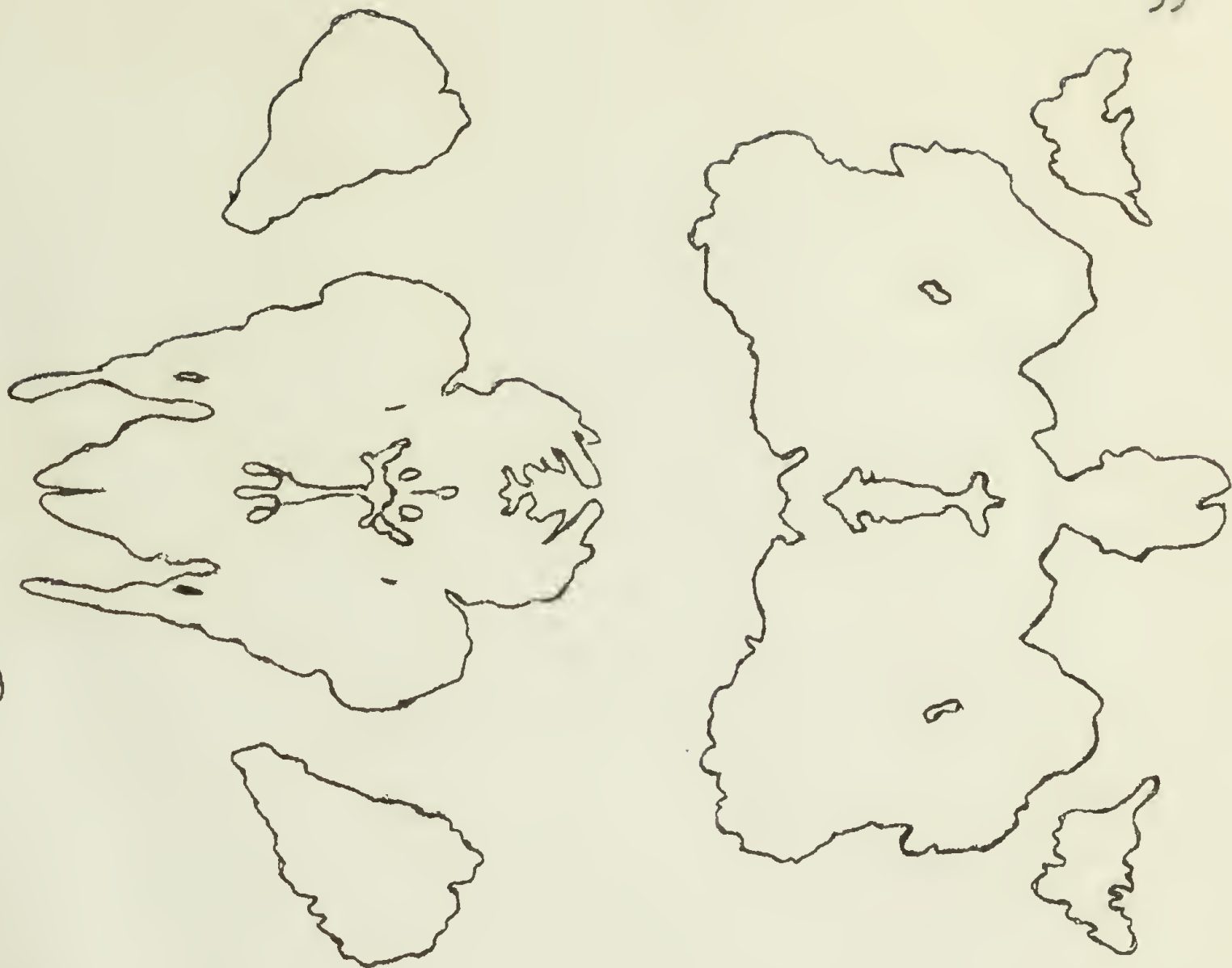
SET IV
CARD 8



SET IV
CARD 7



NAME _____

SET IV
CARD 10SET IV
CARD 9

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APPROVED:

Seymour Epstein

Largus Russell

L. M. Bartlett

Date May 18, 1954

