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A PERCEPTUAL APPROACH TO THE RORSCHACH SHADING RESPONSES

by

Amos J. Vincent, Jr.

Thesis presented to the School of Graduate Studies of the University of Ottawa as partial fulfillment of the requirements for the degree of Doctor of Philosophy in Clinical Psychology

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CURRICULUM STUDIORUM

Amos J. Vincent, Jr. was ordained a priest of the Roman Catholic Church on June 11, 1949. He received the Bachelor of Arts degree in Philosophy from Notre Dame Seminary in New Orleans, Louisiana, in 1952, and the Bachelor of Canon Law degree from the Catholic University of America in Washington, D. C., in 1954.

The Master of Arts degree in Clinical Psychology from the Department of Psychology of North Texas State University, in Denton, Texas, was awarded in December, 1973. The title of the thesis was The Rorschach Secondary Space Response, prepared under the direction of Professor Thomas Blackmun, Ph.D.

ABSTRACT

This study presented a perceptual rationale for the production of Rorschach shading responses. It was reasoned that shading responses in which form is secondary or absent are verbalized associations to an incompletely differentiated Gestalt, which results from incomplete scanning eye movements and incomplete internal attention shifts during perception. It was hypothesized that these responses are the result of interference by depression and anxiety, through the mediation of a hypothetical construct labeled "perceptual apathy." It was reasoned that shading responses in which form is primary are verbalized associations to a Gestalt which retains shading information from the earlier stages of perception, integrated into the final percept. It was hypothesized that these responses are the result of intelligence, through the mediation of a hypothetical construct labeled "perceptual sensitivity."

Subjects were 149 outpatients whose files contained complete Rorschach, WAIS and MMPI records obtained at admission for diagnostics. MMPI Scales 2 (D) and 7 (Pt) were used as measures of depression and anxiety, respectively. The WAIS FSIQ and Rorschach secondary space responses were used as measures of intelligence for all subjects, and MMPI Scale 5 (Mf), for males.

The Rorschach protocols were rescored, using the Exner system. Exner's Comprehensive System was also used as the authority for interpretation of other Rorschach variables. A previously unused technique was employed to solve the problem of different numbers of total responses to the Rorschach. Normalized T-scores were constructed for all response categories, within various groupings of length of records. This approach controlled for different meanings of the same score on protocols of differing length, avoided problems of indexing encountered when using proportions of total number of responses, and achieved normal distributions.

Hypotheses were tested through correlation analysis, canonical correlation, and factor analysis. Correlation analysis did not reveal any significant relationship between the shading and shading-form responses and the measures of depression and anxiety. Factor analysis indicated that these responses are compatible with the hypothetical construct of "perceptual apathy," and in some cases, the product of a kind of creative imagination.

Correlation analysis revealed a significant relationship between the form-shading responses and FSIQ, and between these responses and secondary space responses. Factor analysis indicated that these responses are determined by three factors, identified as perceptual sensitivity,

perceptual and behavioral organization, and functional autonomy. No relationship was found between form-shading responses and MMPI Scale 5 (Mf) for the males in the sample.

Canonical correlation analysis did not reveal any significant correlation between combinations of variables from the MMPI Scales and FSIQ as the first set, and the Rorschach response scores as the second set.

Further research was suggested, using large samples, in order to separate the various kinds of shading: texture, vista, and diffuse shading, which were considered together in this study.

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INTRODUCTION

To the historian of psychology looking over the 59 years that have passed since Hermann Rorschach's ink blots and the accompanying manual of psychodiagnostics appeared publicly for the first time (Rorschach, 1921), two things are striking. The technique soon became, and apparently still remains a favorite of a great many psychologists who are concerned mainly with clinical practice; and it has generated a vast amount of research, most of it with, at best, equivocal results.

A little over 25 years after it appeared, it had become the fourth most commonly used test, at least in the United States (Louttit & Brown, 1947). Twelve years later, in 1959, it had risen to first place (Sundberg, 1961). Although the years following the "golden age" of the Rorschach in the 1950's have seen predictions of the demise of diagnostic assessment by psychologists in general, and of psychological testing, in particular, these predictions seem not to have been fulfilled. As recently as four years ago, Wade, Baker, Morton, and Baker (1978) reported that frequency of test use, both for objective and for projective tests, was still quite high in the representative sample of clinical psychologists whom they surveyed. They found that objective tests were being administered to more than a third of the clients, and

projectives to more than a fifth. The clinicians surveyed were asked to indicate which tests they would recommend that clinical psychology students learn. The most frequently recommended test was the Rorschach, with the Thematic Apperception Test (TAT), the Wechsler Adult Intelligence Scale (WAIS), and the Minnesota Multiphasic Personality Inventory (MMPI) next in line. It appears that the Rorschach does, indeed, remain a favorite of many of those in clinical practice.

Nor has research employing the Rorschach technique ceased. Although much of the research is inconclusive, the search for the reasons why continues.

Research into the meaning of the responses to the shading qualities of the blots is of particular interest. In his revision of the 1945 text by Rapaport, Gill, and Schafer, Holt retained Rapaport's statement that the inferences drawn from shading responses "have been the least validated of all the Rorschach test indicators" (Rapaport, Gill, & Schafer, 1968, p. 394). A new edition today would still have to retain the same statement.

Most of the research into the shading responses has followed the classical hypothesis of the sytematizers, agreeing with Rorschach himself, that shading is connected with anxiety. In their review of the literature on the assessment of anxiety with the Rorschach technique in terms of the distinction between anxiety as a trait and as

a state, Auerbach and Spielberger (1972), although able to draw a few tentative conclusions, found numerous examples of conflicting results.

Most recently, Frank (1978) reviewed a substantial body of literature dealing with the validity of hypotheses derived from the Rorschach on the relationship between shading responses and anxiety, and again found more conflict than agreement. After pointing to several methodological and epistemological issues involved in the problem, he observed that

> at this point, all we can conclude is that we have not clearly delineated: (1) what dimensions of the blots specifically and consistently reflect anxiety, (2) whether there are styles of responsiveness to the Rorschach stimuli which characterize the way certain individuals selectively manifest anxiety on the Rorschach, and (3) since we have already discovered that the color dimension of the Rorschach does not possess intrinsic, symbolic meaning in and of itself (Frank, 1976), whether the shading dimension does. What we can conclude from this research is that we need more research, <u>but not more of the same kind</u>. (pp. 536-537)

One of the epistemological issues raised by Frank is that of the hypothesis itself, that shading responses in the Rorschach "mean" anxiety. An issue which he did not raise is that virtually none of the research proceeds from a perceptual foundation, in spite of Rorschach's (1921) clear indication that his technique was a test of perception.

The present study is an attempt to follow Frank's advice concerning more research, but not more of the same kind, which has assumed the validity of the universally popular hypothesis among all the systematizers linking shading and anxiety, but without providing a rationale for this.

It is proposed in the present study that the shading responses to the Rorschach ink blots are the result of an interference in the perceptual process, which, in turn, is the result of certain personality variables, namely, process anxiety and depressive process.

The purpose of this study is fully presented in the review of literature in the first chapter, which first describes the shading responses themselves, the method of scoring them, and the traditional method of interpreting their meaning; secondly presents a perceptual theory based on empirical findings; thirdly discusses the reasons why anxiety and depression are expected to interfere with perception and produce the shading responses, and why intelligence is expected to produce form-determined responses incorporating shading nuances; fourthly discusses the methods of measurement available for process anxiety, the process of depression, and intelligence; and, finally, closes with a conclusion, statement of the problem and research hypotheses.

Chapter II discusses the nature of the subjects, the data used in the study, and the manner in which the data were analyzed. The results are presented in Chapter III, and Chapter IV presents a discussion of the findings.

CHAPTER I

REVIEW OF THE LITERATURE

The Nature of the Shading Responses

In the work which led to his publication of the ink blots and the Psychodiagnostik, Rorschach had already determined that by far the more important fact about his patients' responses to his question as to what the blots might look like was not the content of the responses, but the manner in which the patients made the responses. In this process, he distinguished two factors: the manner in which the individual approached the blot--either the entire blot or parts of it--which he indicated by the "location scores;" and the features of the blot which prompted the particular response, indicated by the "determinant scores" (Rorschach, 1921, 1942). In the original monograph, he made no mention of shading among the determinants, because the blots he had been working with were of uniform hue. A printer's or engraver's error, however, produced the variations in the pigment which have since come to be called shading (cf. Ellenberger, 1954). Rorschach was quick to observe that some subjects responded to these variations, which he referred to as the "light-dark" (Helldunkel) qualities of the stimulus.

In an extensive review of the scoring problems involved in the shading responses, Campo and de de Santos (1971), after quoting each of Rorschach's references, summarized them as follows:

> If we let ourselves be guided by the previous quotations, we will see that Rorschach uses three terms:
>
> (1) Nuances: Schattierungen in German, shading or chiaroscuro in English, estompage in French, sombreado or matizado in Spanish.
>
> (2) Light-dark: Helldunkel in German, Chiaroscuro or shading in English--according to each school (Rapaport or Klopfer for instance)--Clairobscur or Clob in French, claroscuro or sombreado in Spanish.
>
> (3) Chromatic value of the black, grey, or white ". . . white and black as color values [p. 185]". Rorschach uses the three terms without distinctions to construct his definition of the F(Fb). (p. 4)

Some of the systematizers have followed Rorschach's lead in this, defining a shading response as one made to any of these three characteristics of the blots. Others have excluded the last of the three.

In the later part of this chapter, reasons will be given for defining the shading response as an association to a diffuse undifferentiated percept. In general, however, in the present study, a shading response is defined as a response determined by the shading qualities of the blot. The shading qualities of the blot are meant to include only the first two of Rorschach's terms. These have been precisely described by Eckhardt (1957):

> Brightness Contrast . . . an abrubt change from one degree of brightness to another. (p. 172)
>
> Brightness gradients . . . gradual changes between different degrees of brightness. (p. 172)

Therefore, shading as a quality of the stimulus is taken here to mean the variations of lightness and darkness (what Eckhardt calls "degrees of brightness") which may in some cases distinguish some inner shapes in the blot from others, and may in some cases cause the blot (the surface area contained within the contour which separates the pigmented figure from the white ground), to have a diffuse, undifferentiated appearance. A response determined by these chatacteristics means an image which is associated to the perception of the blot because of these qualities. This determination may be primary, or it may be secondary, where the primary determination is by the shape, or form, of the blot.

Beginning with Binder (1937), some attention began to be given to these niceties in the concept of shading, in the separate consideration given to the two problems of scoring and interpretation. They will be considered separately here. Because the problem of defining the shading responses, as well as that of interpreting their clinical significance, is bound up with the scoring systems, the main ones will be reviewed.

Scoring

Binder (1937) divided the shading responses into those which he called "faceted," based on a number of discrete shadings, which he labeled F(C) (Rorschach's symbol), and those based on a diffuse impression of shading, or chiaroscuro, which he labeled (Ch). One of his criteria for the latter was that the response reflect "a dysphoric mood" (p. 38).

S. J. Beck (Beck, Beck, Levitt, & Molish, 1961) divided the shading responses into "flat gray" responses, which he scored with the symbol Y, those perceived as texture, scored T, and those in which the shading is used to perceive three dimensions, scored V, for vista. However, he included in the V scoring all three-dimensional responses, without requiring that they be specifically determined by the shading qualities of the blot.

Piotrowski (1974) distinguished between those responses made to the black or dark shades of grey, scored c', and those made to the lighter shades of grey, scored c. But in an echo of Binder's "dysphoric mood" criterion, he added that "all meaningful responses which express a definite feeling of disgust or of repulsion and are plainly associated in the subject's mind and spoken words with dirt, ugliness, or horror" (p. 257) should be considered as responses determined by the dark shades of grey.

Hertz (1951) used three scoring symbols for shading. The symbol c was used for textural or reflective responses, (C) for three dimensional responses based on shading, and Ch for all other shading responses.

Klopfer (Klopfer, Ainsworth, Klopfer, & Holt, 1954) developed the most complex of the scoring systems for these responses. He designated all three-dimensional responses by the symbol FK (apparently assuming as did S. J. Beck that all such responses were determined by the shading qualities of the blot rather than by spatial configurations), diffuse shading responses by K, three-dimensional scenes or perceptions reduced to two dimensions (such as X-rays), by k, and surface effect or texture responses by c.

All these systematizers added the symbol F to these various shading symbols to indicate whether form was involved in the response, placing the F before or after the shading symbol to indicate the extent of form involvement. So, for example, S. J. Beck (Beck, Beck, Levitt, & Molish, 1961) scored a response determined entirely by flat grey shading as Y, one determined primarily by this kind of shading but secondarily by form as YF, and one determined primarily by form but secondarily by flat grey shading as FY. Klopfer (Klopfer, Ainsworth, Klopfer, & Holt, 1954) placed the F before or after the shading symbol depending on whether the form was definite or indefinite.

Piotrowski (1974), on the other hand, combined his c'F and c' scores into a single c' category, and his cF and c scores into a single c category.

And there are still other scoring systems, such as those of Rapaport (Rapaport, Gill, & Schafer, 1954), Phillips and Smith (1953), all of whom follow Rorschach's usage to some extent, Loosli-Usteri (1929), and others.

Even this cursory review of the various scoring systems indicates that there is considerable divergence about the scoring of these responses. In their comprehensive review of the shading scoring systems, Campo and de de Santos (1971) observed that much of the confusion arises from failure to define shading very carefully, and even more so from failure to distinguish between the characteristics of the stimulus to which the association is made, and the characteristics of the associated image itself.

All these systems of scoring shading responses are to some extent vulnerable to the criticism which Campo and de de Santos (1971) made of the scoring systems generally, and of Binder's in particular. In speaking of Binder's scoring, they identified three flaws: (1) confusion of perceptual and content components, (2) failure to distinguish the use of black or grey as a color from the use of shading as such, and (3) assumptions, based on Binder's theory of central and peripheral feelings, which determine the scoring, and which ultimately lead to circular logic

both in the scoring and in the interpretation of these responses (pp. 5-9).

In a systematization which has come some 25 years after the others, Exner (1974) has critically examined the various systems, and has derived from them a scoring system which seems to avoid these flaws. He has classified the various shading responses into a sufficient number of categories to account for the various components of the stimulus itself, while excluding those scorings that are based on content components rather than on the stimulus qualities. Because they seem to be by far the most accurate symbols now in use, they are used in the present research, and are therefore presented here in some detail.

Exner's Scoring for Shading

Exner (1974) includes under the shading determinants three classes of them: texture, shading-dimensionality (or vista), and general-diffuse shading. Although he does not give an explicit definition of the shading components of the stimulus, referring simply to the "light-dark features of the blot" (p. 86), it is clear from his discussion (pp. 86-88) that he defines the shading components of the stimulus in the same way that they are defined in this study, that is, as the variations of lightness and darkness which may in some cases distinguish some inner shapes in the blot from some others, and may in some cases cause the

blot to have a diffuse, undifferentiated appearance. Each of these three categories of shading scoring is presented separately with its subdivisions, in the following section.

Texture determinants. The pure texture scoring, T, is used "for answers in which the shading components of the blot are represented as 'textural' with no form involvement" (Exner, 1974, p. 89).

The texture-form score, TF, is used for a response "in which the shading features are interpreted as texture and form is used secondarily for purposes of elaboration and/or clarification" (p. 89).

The form-texture score, FT, "is used for responses in which form is the primary determinant and the shading features, articulated as texture, are used secondarily for purposes of elaboration and/or clarification" (p. 91).

Shading-dimensionality determinants (vista). The pure vista score, V, "requires that the subject reports depth or dimensionality based exclusively on the shading characteristics of the blot, with no form involvement" (p. 92).

The vista-form score, VF, is used for responses which "include primary emphasis on the shading features to represent depth or dimensionality and incorporate the form features of the blot for clarification and/or

elaboration" (p. 92).

The form-vista score, FV, is used for responses "in which form is the primary feature and the shading component is used to represent depth or dimensionality for purposes of clarification and/or elaboration" (p. 92).

General-diffuse shading determinants. The pure shading score, Y, is used for responses "based exclusively on the light dark features of the blot. No form is involved, and the content used typically has no form feature" (p. 96).

The shading-form score, YF, is used for responses "in which the light-dark features of the blot are primary to the formation of the response and form is used secondarily for purposes of elaboration and/or clarification" (p. 96).

The form-shading score, FY, "is used for responses in which form characteristics are primary to the formation of the percept, and shading is used for purposes of specification and/or elaboration" (p. 96).

A careful examination of these scoring categories of Exner shows that he has avoided the problem of idiosyncratic responses automatically scored as shading, such as vista and reflection responses, even though shading is not mentioned, which is one of the problems with the Klopfer system. (Vista responses are included in shading by Exner only if determined by shading, and reflection responses are excluded, being designated by a special scoring.)

He has likewise overcome the problem with the Beck system, by excluding from the shading scoring those responses based on the use of achromatic color, which has its own scoring category.

It could still be argued that in the scoring of the vista responses, Exner is scoring the content rather than the features of the blot. However, the use of the shading qualities of the blot to achieve an impression of dimensionality is a part of the perceptual as well as the associative process, and the scoring seems justified, particularly since it is a separate scoring which can be kept separate from the other shading determinants for purposes of analysis.

The matter of scoring has been presented at some length, because it illustrates that (1) the very symbols themselves can be a source of confusion, (2) the various systematizers are not in agreement on what precisely constitutes shading responses, and (3) Campo and de de Santos (1971) were correct in stating that failure to define the shading qualities of the blot, and the responses to them, and to keep the two separate, constitutes a large part of the problem.

This failure to be precise in definitions and distinctions has been one of the sources of difficulty in the interpretation of the meaning of the shading responses, as will be seen in the next section.

Interpretation

If the scoring systems used for shading responses are less than unanimously agreed upon, the interpretation of the clinical significance of these responses is further evidence of disagreement.

In the analysis of the protocol of Oberholzer's patient appended to the published text of his monograph, Rorschach commented on the shading responses, in what has become a classic source for interpretation. (It should be noted that in this passage from Rorschach, the word interpretation is the translator's English for Rorschach's German. The word means, in modern Rorschach usage, response.) Rorschach's statement was

> The symptomatic indications inherent in such interpretations are not yet entirely clear; the interpretations appear to have something to do with the capacity for affective adaptability, but also indicate a timid, cautious and hampered sort of adaptability. Further, they indicate self-control before others and a tendency toward a fundamentally depressive disposition which the subject tries to control when others are present. (1942, p. 195)

With the excpetion of his colleague, Oberholzer, most of the later writers took Rorschach's words to mean anxiety, paying less attention to his hypothesis of depression. Oberholzer (1944), without elaborating on the nature of the responses scored as shading, made a brief contribution to their interpretation which has become another of the classic sources. In a chapter of a book

about the people of the island of Alor, he stated that these light-dark determined responses were an expression of

> lack of energy, will power and initiative . . . , expressions of inertia and indolence, of indifference and listlessness to the point of complete torpidity and apathy . . . resignation. (p. 597)

The earliest systematic interpretation of these responses was that of Binder (1937). His system is today of mainly historical interest, based as it was on his outdated theory of emotions, although as recently as 22 years ago, Bohm (1960) noted that "European workers consider Binder's writings among the most important publications in the field" (p. 202). Binder's emphasis on "dysphoric mood" has persisted to some extent in the various systems.

S. J. Beck (1946), apparently drawing on the thinking of Binder and Oberholzer, saw the shading responses as indicating an anergic state, oppressive affect, as least in organically intact patients. Later (S. J. Beck, 1952), he interpreted these responses to mean also a defense of emotional passivity against free floating anxiety, as indicators of gloom. Finally (Beck & Molish, 1967), he added the nuance of "hypersensitivity as reaction to environmental threat" (p. 384).

The other writer who has given the most complete interpretation of the meaning of the shading responses, and whose hypotheses have probably been most influential in

the published research, is Klopfer. In his final revision (Klopfer, Ainsworth, Klopfer, & Holt, 1954), he formulated hypotheses for each of his categories of shading scoring:

> K and KF indicate anxiety of a diffuse and free floating nature, reflecting a frustration of affectional satisfactions. (p. 268)
>
> k indicates affectional anxiety behind a good front of outward control and is found with subjects who cover up their anxiety with an intellectual cloak. (p. 269)
>
> c indicates an infantile, undifferentiated, crude need for affection of an essentially physical contact variety. . . . They are usually found only with patients having serious organic brain damage. (p. 271)
>
> cF responses represent a relatively crude continuation of an early need for closeness, a need to be held and fondled and a longing for an infantile sort of dependence on others. (p. 271)
>
> Fc responses indicate an awareness of an acceptance of affectional needs experienced in terms of desire for approval, belongingness, and a response from others, retaining a passive recipient flavor but refined beyond a craving for actual physical contact. (p. 273)

Piotrowski (1974), apparently influenced somewhat by Binder, has adopted a unique interpretation of shading. He saw responses to the dark shading as indicating potential for motor activity, such as assertive behavior, and light shading responses as indicating a compliant attitude in the face of interpersonal anxiety.

Other interpretations, such as that of Rapaport (Rapaport, Gill, and Schafer, 1968), generally have put forth the hypothesis of anxiety as being connected with shading

responses, although Phillips and Smith (1953) seem closer to S. J. Beck.

Since the hypothesis of shading being connected with anxiety is so ubiquitous in the Rorschach clinical literature, it is hardly surprising that most of the research reported in the journals has been concentrated on this hypothesis. This research will be reviewed, in order to arrive at an understanding of the present state of the research.

Research on the Shading-Anxiety Hypothesis

There have been a number of studies testing the hypothesis of shading responses indicating anxiety (e.g., Allerhand, 1954; Cox & Sarason, 1954; Krauss, 1964; Lebo, Toal, & Brick, 1960; Levitt, 1957; Levitt & Grosz, 1960; Neuringer, 1962; Waller, 1960). Many of these studies used low and high anxiety groups, with results analyzed to test the difference in mean number of shading responses between groups, and interaction with other factors. Results of these studies have been mixed.

In a review of the studies published through 1971, Auerbach and Spielberger (1972), although confronted with a number of inconsistencies in the results, were able to conclude that shading responses were probably the only reliable Rorschach indicator of state anxiety, but not of

trait anxiety, at least on the basis of the available research.

Elstein (1965) tested S. J. Beck's hypothesis that shading responses indicate inhibition of or withdrawal from activity with an accompanying undertone of anxiety, as a result of withdrawal and underactivity of the healthy emotions. He found some support for the hypothesis, concluding that "High Y subjects tend to be more inhibited . . . or resigned. . . . The Low Y subjects, by contrast, tend to be more critical" (p. 234).

Wagner and Slemboski (1969) tested Piotrowski's hypothesis concerning light and dark shading by dividing their subjects into an "assertive" group and a "compliant" group. They found that the assertive group gave more dark shading responses, while the compliant group gave more light shading responses, tending to confirm Piotrowski's interpretation. However, when they analyzed their data by sex, they found that it was not the presence of dark shading, but the relative absence of white shading that correlated with male assertiveness. This kind of ambivalent finding seems to be a characteristic of the studies on shading and anxiety, as Auerbach and Spielberger (1972) indicated.

In view of this, it would be expected that other kinds of research would be undertaken. At one time, there

was considerable interest in another line of study, factor analysis. This is examined in the next section.

Factor Analytic Studies

A logical question concerning the meaning of the shading responses (or any other class of responses) would be to inquire what other measures load on the same factors as the responses in question, if submitted to factor analysis.

Beginning in 1949, there was a spate of studies in which Rorschach data were submitted to factor analysis, but all of them, unfortunately, used less than optimal methodology, and not all of them investigated the meaning of a particular class of Rorschach responses, such as the shading responses.

Wittenborn (1949) obtained data using the Harrower-Erickson checklist (Harrower-Erickson & Steiner, 1945), in which only one response is recorded for each Rorschach card. He concluded from this only that certain individual responses on the checklist "are intercorrelated in a fashion to yield factors some of which are clear-cut from the quantitative standpoint (p. 340)," and that "there is evidence that certain so-called 'pathological' responses possess an important functional similarity (p. 340)," i.e., they load on the same factor. But there was no attempt to investigate the "functional similarity" of shading

responses and other responses. Further, tetrachoric correlations were computed, and analysis was by the centroid method.

Wittenborn (1949) later analyzed by the centroid method data for 20 Rorschach response categories obtained from 120 subjects. He found that the various shading determinant scores clustered together on a factor which he labelled "perceptual control (p. 470)," and concluded that this could be

> taken as an indication that the behavioral distinctions between the color, texture, and vista determinants may be greatly exaggerated and that the scoring distinctions for these three determinants could be relatively trivial. (p. 470)

However, although product-moment correlations were computed, there was no control for skewness of distributions, and no control for the varying number of total responses.

Adcock (1951) analyzed data for 88 Cook Island and 30 New Zealand children. He found that shading responses loaded high on the same factor as Form responses for the Cook Islanders, but that the opposite was true for the New Zealanders. He attempted to explain this in light of the different methods of compensating for constriction of expression in the two cultures. He did not address the fact that this appears to be an ad hoc explanation. Besides, the computed correlations were tetrachoric, there was no control for the number of responses per subject, and analysis was by the centroid method.

Cox (1951), after a complex method of arriving at dichotomous scores on a number of Rorschach variables, computed tetrachoric correlations, and submitted the data to centroid analysis. There was no control for total number of responses per subject. The shading scores which she included loaded highest on a factor which she labeled "a general factor of productivity (p. 101)." She did not attempt any interpretation of this.

Williams and Lawrence (1953), without controlling for the total number of responses, computed tetrachoric correlations for 20 Rorschach variables, and for Verbal Intelligence Quotient (VIQ) and Performance Intelligence Quotient (PIQ) scores from the Wechsler-Bellevue (W-B) test, and then performed a centroid analysis on their correlation matrix. Regarding shading responses, they were able to conclude only that one of their factors provided "some support for the common practice of scoring shading separately from other variables, although it does not demonstrate that fine distinctions between the various qualities of shading are warranted" (p. 264).

Later (Williams & Lawrence, 1954), they performed a centroid analysis on 17 Rorschach variables, VIQ from the W-B, and 14 MMPI scales, for 100 psychiatric patients. They were not able to draw any conlcusions as to the meaning of the Rorschach shading scores in terms of the MMPI. In this analysis, product-moment correlations were

computed between the various MMPI scales, but all other correlations were tetrachoric. There was no control for the total number of responses per subject.

Borgatta and Eschenbach (1955) performed a centroid analysis on 15 Rorschach variables and 25 other behavioral rating and mental test scores. The Rorschach shading variables loaded heaviest on the factor which they labeled the "Rorschach productivity factor" (p. 131), which they further identified as being in "response to some of the more formal properties of the Rorschach" (p. 131). However, there was no control for total number of responses per subject, and no control was reported for skewness of distributions.

Coan (1956) refactored some of the correlations from Wittenborn's (1950) data, using only the Rorschach determinants. He found that shading responses which were made primarily to the shading qualities of the blot, with form as a secondary determinant, or absent altogether, loaded highest on a factor he labeled "low order of perceptual control (p. 285)," and that those shading responses which were primarily form responses, with shading secondary, were highest on a factor identified as representing "a contrasting factor of controlled emotionality (p. 286)." The control used for the varying number of total responses per subject was simply to omit the R, or number of responses, score, from the correlation matrix. The analysis

was centroid.

Glickstein (1959) published a corrected matrix of Wittenborn's (1950) correlations, after attempting to remove the influence of the varying total number of responses per subject through partial correlation. Wittenborn (1959) strongly objected to this procedure. But Glickstein did not factor analyze the corrected matrix.

Wishner (1959) analyzed 20 Rorschach variables for 157 subjects previously tested by Beck, Rabin, Thiesen, Molish, and Thetford (1950), after obtaining product-moment correlations. He found shading responses loading heaviest on a factor which he identified as one of "psychological efficiency (p. 407)," which he felt could be identified at "a higher level of abstraction . . . as flexibility-rigidity (p. 409)," with the shading responses indicating flexibility. Product-moment correlations were used, but without any reported control for total number of responses per subject. Analysis was by the centroid method.

Geertsma (1962) refactored Wishner's (1959) matrix of correlations, using the method of principal components. His results indicated a separate "shading factor (p.22)," and a separate "vista factor (p. 22)," but he did not attempt to attach any interpretative meaning to them. And he did not overcome the original flaw of lack of control for the total number of responses per subject.

From the foregoing review, it is clear that the factor analytic studies having to do with the Rorschach technique are not very recent, and that none of them are outstanding for statistical sophistication.

Even without attention to the methodological flaws, none of these studies are particularly useful, as none of them attempted to determine the meaning of individual categories of Rorschach responses, although several of them did identify certain categories as being identified with one or another of the factors extracted from the matrix of correlations. While this may be of some help in forming hypotheses for future research, it still tells little, if anything, of the connection between the variance in any one response category and that in another.

In addition, three methodological flaws in these studies can be identified:

1. Some of these studies attempted to identify factors extracted from the correlation matrix in terms of more general personality characteristics, rather than in terms of the specific variables entered into the matrix. This has led to problems such as that mentioned by Borgatta and Eschenbach (1955). They noted that in one study by Williams and Lawrence (1953), factoring Rorschach determinants and two intelligence scores, a factor was identified as intelligence; but that in a second study by the same investigators (Williams & Lawrence, 1954), factoring

Rorschach determinants with MMPI scores and an intelligence score, what was apparently the same factor emerged as "ego-strength" (Borgatta & Eschenbach, 1955, pp. 133-134).

2. In many cases tetrachoric correlations were used. In view of the larger sampling error involved in tetrachoric correlations, this procedure is questionable, especially with the large number of correlations involved in factor analysis, where error can accumulate.

3. Most of these studies did not control for the varying number of total Rorschach responses in the individual protocols. While there are statistical problems involved in this, the problem cannot be ignored. A subject who gives, for example, three shading responses in a total of ten responses, can hardly be considered to match one who gives three shading responses in a total of 54. Also, Cronbach (1949) mentioned the likelihood of spurious differences between groups on certain Rorschach variables, which vary with the number of responses, when the influence of the latter is not taken into account (p. 409). Although Cronbach's critical article was concerned mainly with spurious differences between groups, problems also arise in correlations between the Rorschach variables themselves, and between these and other variables. These problems have to do with each variable being a portion of the total number, and the problems that arise from

spurious correlation due to indices if they are treated as simple proportions or percentages of the total number. In addition, most of the studies made no mention of control for skewed distributions, and failure to correct for skewness results in spurious upper limits on correlation (cf. McNemar, 1969, pp. 186-187).

Finally, although Williams and Lawrence (1954) performed what amounts to basically the same kind of factor analysis as used in this study, they used only the VIQ from the Wechsler-Bellevue (W-B); they did not control for the total number of responses on the Rorschach per subject; and they used tetrachoric correlations for the MMPI with other variables.

It is puzzling that with the advent of more sophisticated techniques of factor analysis and the ease of computing with more sophisticated machinery, new studies have not been done. This may reflect a lack of interest in more advanced statistical techniques on the part of those who are interested in projective tests; or it may reflect a lack of interest in projective tests on the part of those interested in techniques of mathematical analysis. Whatever the reason, the continued widespread use of the Rorschach technique, as mentioned in the Introduction, and the continuing lack of clarity about the meaning of the shading responses indicate that further analysis is in order.

Present State of Research

Since, as Frank (1978) has observed, "for over 40 years the standard interpretation of shading responses is that they reflect the way an individual deals with anxiety" (p. 531), it is not surprising that most, if not all the research into the shading responses has started from that hypothesis. Since Frank's review of the studies thus far undertaken, and his conclusions from them, are among the most perceptive to date, they will be summarized here.

Frank (1978) has indicated that there are two sets of issues requiring attention, which he has identified as methodological and epistemological. Among the methodological issues he lists the confusion of various kinds of anxiety, including confusion of anxiety from a single stress with that from several stresses, as well as confusion of anxiety from internal and from external stress; the problems connected with the scoring of the shading responses (problems which Exner has done much to resolve); and the problem of assessment of anxiety by various means.

Among the epistemological issues he lists the definition of anxiety; the statement of hypotheses, particularly the ubiquitous hypothesis connecting shading only with anxiety and thus precluding the discovery of other possible meanings of the response; and the lack of anything more than conjecture or intuitive rationale "to explain

why an individual's response to shading should be interpreted in terms of the way one deals with anxiety" (p. 536).

Frank's epistemological issues are particularly deserving of attention. One conclusion from his considerations could be stated as follows. An investigation into the meaning of any phenomenon, and this includes the Rorschach shading responses, should begin with an examination of the phenomenon itself, not with an assumption that it is connected with something else, merely because it has been thought to be so connected by many people (who have not given a reason why they think so). Once the phenomenon is seen for what it is, and consequently better understood, then hypotheses may be drawn about what it is likely to be connected (correlated) with (possibly including what it was always thought to be connected with), and tested. In this way, other connections, or correlations, are more likely to be hypothesized and tested. In any case, the investigator is further along the way to understanding why the connections are found, or not found.

There is, however, a further epistemological issue, at which Frank has only hinted, and which is crucial to the understanding of this study.

This issue has to do with the causal relationship between the shading responses and the personality variables

which they are hypothesized to reflect. In the interpretation of a Rorschach protocol, the responses are taken as "indicators" of personality variables. This implies the assumption, unspoken but real, that the personality variables are what determined the observed behavior, the responses to the blots.

In the case of the shading responses, the "ubiquitous hypothesis" to which Frank refers, that shading "means" anxiety, the underlying assumption is that anxiety causes the shading responses. But, while anxiety is an observable and definable state of the organism, and a shading response is an observable behavior, there is no observable manner in which this state causes the behavior.

Stated in another fashion, the observable anxiety is not and cannot be defined as including the production of shading responses to the ink blots. If anxiety results in shading responses, then there must be another factor which mediates the causal connection between the two. If this mediating factor is not directly observable, but hypothesized to explain the observed phenomena, then it will be either an intervening variable, in the sense defined by MacCorquodale and Meehl (1948), or a hypothetical construct in the sense defined by the same authors.

These authors have defined the intervening variable as

> simply a quantity obtained by a specified manipulation of the values of empirical variables; it will involve no hypothesis as to the existence of nonobserved entities or the occurence of unobserved processes. (p. 103)

They define hypothetical constructs as those constructs which

> involve terms which are not wholly reducible to empirical terms; they refer to processes or entities that are not directly observed (although they need not be in principle unobservable); the mathematical expression of them cannot be formed simply by a suitable grouping of terms in a direct empirical equation; and the truth of the empirical laws involved is a necessary but not a sufficient condition for the truth of these conceptions. (p. 104)

The epistemological problem referred to above, which Frank has not directly addressed, is that no author as yet, so far as can be determined by searching the literature, has hypothesized any explanatory intervening variable or hypothetical construct, although Rapaport (Rapaport, Gill, & Schafer, 1968) seemed close to the idea.

Schafer (1954) used certain psychoanalytic constructs as intervening variables, but did this largely in terms of content of the shading responses rather than the actual determination of the responses by the shading qualities of the blots.

This is the rationale for the approach to the shading responses taken in this study. This approach is threefold: 1) to approach the shading responses as a perceptual phenomenon, 2) to postulate the hypothetical constructs which are the mediators between the personality variables

and the shading responses, and 3) to identify the personality characteristics which are postulated as the independent variables. This approach will be explained in the following section.

A Perceptual Approach to the Shading Responses

This section will investigate recent research, with some of its historical antecedents, into the nature of the visual perceptual process, and will then examine the shading responses in light of this research. Personality correlates of the events postulated to be occurring in the visual perceptual process in the production of shading responses will be identified. The question whether these personality correlates can be measured, and if so, how, will then be discussed.

In the explanation of the rationale underlying his "Test of Response to Shape" (Formdeutversuch), Rorschach (1921, 1942) distinguished between the process of perceiving the visual stimulus presented to the subject--the ink blot--and the calling up of an image from memory to be associated with the newly formed percept. He described this latter process as the "identification of a homogeneous group of sensations with previously acquired analogous complexes, together with all their connections," and called it by the name of "apperception" (1942, p. 17). In

so doing, he was avowedly relying on Bleuler's theory of perception. Schachtel (1966) has said about this, that

> whether one agrees with Bleuler's and Rorschach's concept of perception or not, it is clear that the processes of perceiving the inkblot, of associating remembered ideas and images and trying to integrate them with the inkblot (i.e., to restructure the perception of the inkblot in the light of these images), and, conversely, to try out these images for "fit" (congruence) with the inkblot play a decisive role in the typical "normal" Rorschach response. (p. 13)

Rapaport, alone among the classic systematizers of the technique, seems to have grasped fully the import of this fact, particularly with regard to the shading responses. In maintaining the distinction between perceiving and associating, he saw the former as requiring attention, and the latter, involving concept formation, requiring concentration (Rapaport, Gill, & Schafer, 1968).

In a relatively early study, Bruner (1948) stressed the importance of understanding the Rorschach performance in terms of a general theory of perception, namely, his own theory of perceptual defense. As applied to the Rorschach technique, however, his observations on the processes associated with perceptual defense are applicable only to that part of the process which is association to the perceived stimulus, rather than to the act of perception itself.

There were two studies attempting to relate perceptual processes to shading responses. One of these was

that of Eichler (1951) who found that subjects in an experimentally induced stress group gave significantly more shading responses than did those in a control group. He interpreted his findings to indicate that the anxiety produced "blocked perceptual processes" (p. 532).

In the other study linking the shading responses to the perceptual process, Wittenborn and Mettler (1951) grouped together several of the Rorschach variables, including shading responses, that loaded on a factor extracted from a matrix of Rorschach scores, which they labeled as a "lack of perceptual control score" (p. 331).

If any further investigation along these lines is to be done, then it should be along the lines of looking more closely at these perceptual processes, and especially at the serial process known as the microgenesis of perception. This will be done in the following section.

Microgenesis of Perception

This section will examine some of the early work in the process of perception, and will then examine the more recent studies, and thus arrive at an understanding of the serial process of perception.

Many, if not most, of the early studies in the microgenesis--Werner's (1956) translation of the German Aktualgenese--of perception were reported in European journals.

Flavell and Draguns (1957) have provided a fairly complete review of these early studies, beginning with the work of the German Gestaltists under the leadership of Felix Krueger in the 1920's, and particularly the work of Sander and his students. Although, as Flavell and Draguns (1957) were careful to point out,

> many of these studies would be considered quite poor by today's methodological standards . . . . Few Ss were used and these were seldom experimentally naive, statistics were inadequate or absent, and methods of measuring and evaluating perceptual responses were informal (p. 200),

still, these studies all confirmed that the act of perception is a process over time, albeit a very short period of time--microtime. And they constituted the first evidence that perception is a serial process, and that in the order of visual perception "the initial perception is that of a diffuse, undifferentiated whole" (Flavell & Draguns, 1957, p. 198), and that the formation of the complete Gestalt comes only at the end of the process.

This line of thought and investigation was continued by Smith (1957), who not only reconfirmed the temporal sequential nature of perception, but also pointed to some experimental evidence linking individual differences in the pre-conscious stages of perception to differences in personality.

A decade later, Hochberg (1968) again insisted, on the basis of his research, that

> form perception must be broken down into at least two very different components of processing: one, the input of a single glance; the other, the perceived structure or schematic map . . . within which the separate glimpses take their place. (p. 317)

Subsequent work has continued to confirm that visual perception is, indeed, a microgenetic process, and has cast new light on its various stages.

Research in this area has continued to use the tachistoscopic technique of reduced viewing time, reduced luminosity, or both, to interrupt the perceptual process at its various stages, so that the preconscious stages can be identified and studied.

One of the parts of the process that has received a large amount of attention is the fixations of the eye. A number of studies, ranging from 1935 to 1969, have been cited by Noton and Stark (1971b), which "generally agree in showing that fixations tend to cluster at angles and line ends, and, in more complex patterns, on intricate or unpredictable details" (p. 930). Yarbus (1967) had observed that certain individuals tended to follow the same pattern of fixating the various features of a figure upon repeated viewing of it.

Noton and Stark (1971a, 1971b), drawing on their own experimental evidence and that of others, have established that visual perception is a serial process on grounds that seem sufficiently firm to rule out any further doubt.

While the main thrust of their work has been to verify their own theory that different individuals follow different scanpaths in saccadic eye movements when viewing and recognizing patterns, and that these scanpaths remain relatively stable for a given individual viewing a given pattern, their research has also established that not all individuals follow these patterns. They have also theorized on solid grounds, that in those cases where the serial saccades of the scanpath do not take place during visual perception, and even where they do, internal shifts of attention to the visual features of the stimulus also take place. They were able to reach five conclusions:

> (1) There is increasing theoretical and experimental indication that pattern perception and recognition are often serial operations, in which the brain processes the pattern feature by feature. . . .
>
> (2) Normally this serial processing is largely internal and beyond investigation, but by presenting patterns to subjects under conditions of poor visibility . . . we were able to observe from the subjects' eye movements the order of processing of successive features. . . .
>
> (3) During initial viewing or learning of a pattern, the subject's eye usually scanned over following, intermittently but repeatedly, a fixed scanpath characteristic of that subject viewing that pattern. . . .
>
> (4) In explanation of these results we advance a theory of pattern perception . . . . It is suggested that the internal representation of a pattern in memory is a network of features and attention shifts, with a habitually preferred path through the network. . . .

> (5) Explanation . . . in terms of low-level control of the eye by peripheral feature detectors was considered improbably because of the differences in scanpaths of different subjects for a given pattern. And explanation in terms of eye movement habits independent of the pattern viewed was rejected because of the difference in scanpaths of a given subject for different patterns. (Noton & Stark, 1971b, pp. 939-940)

Engel (1971, 1977) has demonstrated that this serial process is also responsible for data reduction in the visual system, through both eye movements and selective attention, both of which he has hypothesized are subject to both voluntary and involuntary control.

In this body of research concerning the visual perceptual process there seems to lie the answer to the question as to what is happening in the Rorschach shading response. From it is drawn the following rationale, presented in the next section.

Perceptual Rationale for Shading Responses

The foregoing insights into the perceptual process provide a framework within which to understand the Rorschach responder who forms a diffuse, undifferentiated percept--the element which emerges towards the beginning of the visual perceptual process--without completing the process to achieve a final Gestalt that corresponds to the differentiating features of the blot--the element which emerges at the end of the process--and who associates to

this vague, undifferentiated percept an equally or nearly equally vague and undifferentiated form from memory; the shading response.

The rationale proposed here is that what is perceived in the Rorschach process is the ink blot, either completely or incompletely. The image which makes up the content of the response through what Bleuler and Rorschach called apperception is not, and cannot be what is perceived. This contra Piotrowski's (1974) statement:

> Even Binder reasons as if the subject went through two different states when giving a blot response; first apprehending a blot, or a part of it, and then imagining an object or process that would fit the usual aspects of the apprehended blot. In actuality, the response and the apprehending of the blot are nearly always simultaneous. It is a unitary process experimentally. The two stages are a product of theoretical analysis, an afterthought, but not distinct ontological entities. (p. 60)

If the perceptual process is interrupted, or, as is more likely, goes to the completion of the Gestalt without completing the intervening eye movements or attention shifts, or both, then it is expected that the percept will be the "diffuse, undifferentiated whole" mentioned by Flavell and Draguns (1957, p. 198), and by Smith (1967, p. 307), or something closely akin to it.

Among the Rorschach ink blots, those with an abundance of shading features are precisely the ones which would meet the description of "more complex patterns" in which, for the normal perceptual process, "fixations tend

to cluster . . . on intricate and unpredictable details" (Noton & Stark, 1971b, p. 930). Conseuqently, if some internal factor is likely to interfere with the perceptual process, or hinder it from operating at its usual efficiency, then it is on the heavily shaded cards, with their intricate and unpredictable details, and requiring the more detailed eye movements or internal attention shifts or both, that the hindrance to the process can be expected to operate most noticeably.

Upon reflection, during the inquiry following the free association period in the administration of the test, the subject would be expected to identify these complexities as the features that "made it look like" the content of the response.

This line of thinking is not entirely without precedent in the Rorschach literature. Rapaport (Rapaport, Gill, & Schafer, 1968) has stated that

> the diffuse shading impression and the gross articulation of the shaded cards both make the articulation of the blots relatively difficult. In anxious persons the articulating and integrating abilities are impaired; thus they fail on these cards more readily than do non-anxious persons. According to this assumption it is not the shading and anxiety, but the gross articulation of the blots, and the articulation difficulty, which are at work. Obviously, the articulation difficulty can be coped with, and this happens in cases where the impact of the diffuse shading impression does not prevent articulation or initiates strong associative processes resulting in responses primarily based on shadings. . . . Subjects with relatively little anxiety

> can bypass this impact or relegate it to a minor role, and can articulate the blot to the point where shading if used at all, becomes a mere embellishment. (pp. 398-399)

Schachtel (1966, pp. 243-256) also seemed inclined to seek the meaning of the shading responses in the anxious subject's difficulty in perceptual "hold," though he was less explicit than Rapaport.

But Rapaport did no more publishing on the Rorschach, and Schachtel was not one of the systematizers, and their line of thought, unfortunately, was not pursued to any great extent.

In the following section, the various kinds of shading responses will be examined in the light of this rationale.

Shading responses and form. The rationale for the shading responses, as presented, refers, of course, to the pure shading responses, whether texture, vista, or diffuse shading, which are not modulated by form.

What of the shading responses which also involve the use of form? For those in which the use of form is primary (Exner's FT, FV, and FY), it is clear that the perceptual process has moved to completion, since the form of the blot has been perceived, and the association made to it. But in this case, the earlier information from the beginning of the process has been retained, and incorporated into the final percept. And in the process of

associating to the percept, this earlier information has also been associated to. This kind of percept, and the response it produces, can best be described as integrated. What has happened here is that the subject has integrated the earlier information into the final percept, and has, in the process, integrated the nuances, the "intricate and unpredictable details" into the overall Gestalt. Stated another way, the subject has formed a Gestalt based not only on the principal features of the stimulus, but also, though in a subordinate manner, on the secondary features, the nuances.

The question of the response in which the principal determinant is the shading, but in which the form is involved secondarily (Exner's TF, VF, and YF) is less easy to answer. Since there is no experimental evidence reported in the literature dealing directly with this phenomenon, the answer must be drawn from the previously cited evidence, although this admittedly involves an element of conjecture. The most likely explanation seems to be that the earlier emergent, the diffuse, undifferentiated whole, one of the precursors of the final Gestalt, has perseverated instead of being transformed or developed, even though enough eye movement or attention shift has occurred to grasp the primary perceptual features and to form the Gestalt. This would seem to be a less serious disturbance of the microgenetic process than that involved in the

production of pure shading responses.

In this section, the visual perceptual process has been examined, and a theoretical rationale has been presented to describe the production of the shading responses. The following section will investigate the hypothetical constructs which would explain this process.

Hypothetical Constructs for Shading Responses

If the shading response consists in associating a vague and undifferentiated image from memory, to a percept that is vague and undifferentiated because of failure of the perceptual process to go to completion, then the next logical step would be to ask what process in the organism would produce this failure in perception, and what personality variable would result in this process. At this point, however, the investigator is addressing something that cannot be observed and measured. Whatever the interior process is, it can only be hypothesized, since it cannot be observed and measured. Admittedly, this clearly involves an inferential leap when the hypothesized relationship between the independent and dependent variables, through the mediation of the hypothesized construct, is tested. Admittedly, also, this kind of inferential leap is problematic, in scientific investigation. In the words of MacCorquodale and Meehl (1948),

> since hypothetical constructs assert the existence of entities and the occurrence of events not reducible to the observable, it would seem . . . that it is the business of a hypothetical construct to be <u>true</u>. (p. 104)

And to establish its "truth," it must be observable and measurable.

However, even such strict theoreticians of science as these two authors concede that much scientific investigation is conducted with the use of hypothetical constructs, and do not find this particularly objectionable, with the proviso, however, that

> it may be fairly demanded of a theory . . . that those elements which are 'hypothetical' in the present sense have some probability of being in correspondence with the actual events underlying the behavior phenomena, <u>i.e.</u>, that the assertions about hypothetical constructs be true. (p. 105)

It is on this basis that the present investigation is conducted. That is, personality correlates are to be identified which can be expected, on the basis of present knowledge, to result in the hypothetically construed interior state or events, which result in the production of the shading response. Two such hypothetical constructs are to identified, one for the shading responses in which the Form determinant of the response is secondary, or completely absent, and another for those in which the Form determinant is primary, and the Shading determinant is secondary.

In this section, the visual perceptual process has

been examined, and a theoretical rationale has been presented to describe the production of the shading responses. The use of hypothetical constructs as mediators, or intervening variables, between personality factors, considered as independent variables, and the shading responses, considered as dependent variables, has been described. The following section will discuss the personality factors which are candidates for the independent variables.

Personality Factors

For the pure shading response, the T, V, and Y, the personality factors are those which would be expected to disrupt the perceptual processes, i.e., the eye movements or (and perhaps especially) the internal shifts of attention. Two such factors can be identified, anxiety and depression. They will be examined separately. Measurement of each will also be discussed.

Anxiety. Most of the research into anxiety in recent years has been based on Spielberger's (1966) distinction between anxiety as a transitory emotional state and as a more or less stable personality trait. The reason for this is that Spielberger has developed measuring instruments for trait and state anxiety which make it possible to define anxiety operationally in research work through the use of these instruments (Spielberger, Gorsuch, & Lushene, 1971).

But Spielberger (1975) has observed that there needs to be added to this two-fold concept a further concept of anxiety as a process. He has described process anxiety as follows:

> Anxiety as a process refers to a complex sequence of cognitive, affective, and behavioral events that is evoked by some form of stress. This process may be initiated by a stressful external stimulus or by internal cues that are perceived or interpreted as threatening. An anxiety state is at the core of the anxiety process, which may also involve (a) cognitive appraisal of a stressful situation as personally threatening, (b) psychological defenses that are activated in an effort to reduce or alleviate intense and unpleasant anxiety states, and (c) behaviors that are motivated by intense levels of A-State. (Spielberger, 1975, pp. 137-138)

Although Spielberger is mainly concerned with the need for developing instruments to measure the various components which make up the process of anxiety, he has made the point that it is in this complex sense that the term "anxiety" is now used by a number of personality theorists. It is used in the same sense by clinicians, as well.

There have been several studies indicating that among the physiological changes involved in an increase in anxiety is a disturbance of the balance in the autonomic nervous system (e.g., Parker, 1955; Smith & Wenger, 1965). The results of these studies are not easy to evaluate, as they used differing measures of autonomic functions, obtaining different results on different measures. What is

evident is that there is disturbance in the autonomic system during anxiety states.

Buss (1968), describing anxiety as a clinical symptom cluster, has provided a description of process anxiety that conforms to what is now known through subsequent research. Among the cognitive symptoms of anxiety he listed worry, dread, inattention, distractibility, and forgetfulness. Among the motor symptoms he listed muscular tightness, tremors, startle reaction, incoordination, and "freezing" (p. 51).

This is the process anxiety which is expected to interfere with the perceptual process and to produce the Rorschach shading response. The disturbance in the autonomic nervous system is expected to interfere with the involuntary control of the eye movements and selective attention mentioned by Engel (1971, 1977). The cognitive symptoms mentioned by Buss are expected to interfere with both the muscular eye movements and the internal attention shifts. The motor symptoms mentioned by Buss are expected to interfere with the scanpath movement of the eyes.

As Frank (1978) observed, there are degrees of this anxiety, and measurement should be in terms of those degrees.

Measurement of process anxiety. Since the kind of differentiated measuring instrument for process anxiety

for which Spielberger has rightly appealed has not yet made its appearance, we are forced to look for a substitute instrument in the meantime, even though the measurement may be somewhat less precise. Fortunately, such an instrument is available in the Minnesota Multiphasic Personality Inventory (MMPI). Scale 7 (Pt) of the MMPI was originally designed to measure the then used clinical concept of psychasthenia; in fact, it appears to measure mainly anxiety. The items in the scale, as noted by Dahlstrom, Welsh, and Dahlstrom (1972) "cover such things as anxiety and dread, low self-confidence, doubts about one's competence, undue sensitivity, moodiness, and immobilization" (p. 213). The same authors reported that the personality features of the standardization group of the scale included "some forms of abnormal fears, worrying, difficulties in concentrating, guilt feelings, and excessive vacillations in making decisions" (p. 211). Both men and women in Hathaway and Meehl's (1952) research group who scored high on this scale described themselves as high-strung.

These descriptors used in reference to MMPI scale 7 (Pt) are presented in columnar comparison to the descriptors from Parker, Smith and Wenger, Spielberger, and Buss in Table 1.

Inspection of the comparison shows that the correspondence between the MMPI Scale descriptors and the

Table 1

Comparison of Descriptors of Process Anxiety

Parker Smith & Wenger Others	Spielberger's Process Anxiety	Buss's symptom cluster	Descriptors of MMPI Scale 7 items and high scorers from Dahlstrom, Welsh, & Dahlstrom, and from Hathaway & Meehl
autonomic nervous system disturbances		muscular tightness	immobilization
		tremors	high-strung
		startle reaction	
		incoordination	
		"freezing"	
	cognitive appraisal of a stressful situation as personally threatening	dread	dread abnormal fears doubts about one's competence low self-confidence
	psychological defenses activated in an effort to reduce or alleviate anxiety state	inattention	difficulties in concentrating
		distractibility	excessive vacillations in making decisions
		forgetfulness	
	behaviors motivated by intense levels of A-State	worry	worrying undue sensitivity moodiness

others, though not perfect, is clear.

This correspondence is confirmed by a study reported by Miller, Fisher, and Ladd (1967). In a study of psychometric and rated anxiety, they investigated the relationships among several measures of anxiety and self-ratings of anxiety of a group of out-patients. They found that MMPI Scale 7 (Pt) had a correlation of .83 with the Manifest Anxiety Scale (Taylor, 1953), of .84 with Welsh's (1956) MMPI First Factor, and .84 with Welsh's Anxiety Index. Although they found a correlation of .45 with the patients' self ratings, this correlation was significant ($p<.05$), and was greater than the correlation (.41) of the patients' self-ratings with the Manifest Anxiety Scale. Therefore, in the absence of a more precise and differentiated measure of process anxiety, it seems justified to use the MMPI Scale 7 (Pt) as a global measure.

Depression. The other personality correlate hypothsized to interfere with the perceptual process is depression.

Within fairly recent years there has been a number of monographs and published symposia proceedings investigating the etiology, classification, and treatment of depressive disorders (e.g., A. T. Beck, 1967; Becker, 1977; Burrows, 1977; Cole, 1978; Gallant & Simpson, 1976; Levitt & Lubin, 1975). None of these has been able to provide a

satisfactory definition of depression.

White (1977) has observed that among psychoanalyts there is no general consensus about the nature of depression, although Bibring (1953) and Davis (1976) have indicated that there is a tendency among psychoanalytically oriented therapists to move away from the notion that depression is always hostility or anger directed towards the self, and to see it rather as a feeling of helplessness and powerlessness. This seems congruent with Seligman's (1974, 1975) concept of depression as learned helplessness, in which the chief characteristic is perceived noncontrol.

Akiskal and McKinney (1973) have listed four models of depression, based on differing theoretical orientations:

> (1) The "aggression-turned-inward" model, originally proposed by Abraham and later elaborated by Freud, sees depression as hostility turned inward upon the loss of an ambivalently loved person . . .
>
> (2) The "object loss" model, which also has its roots in psychoanalysis . . . views depression as a reaction to the loss of a loved object. . . .
>
> (3) The "reinforcement" model, which utilizes behavioral concepts, postulates that depression is the name given to behaviors that result from the loss of major sources of reinforcement, followed by operant conditioning in the form of attention and sympathy. . . .
>
> (4) Finally, the "biogenic amine" model, which focuses on biochemical derangements, hypothesizes a state of the central nervous system characterized by a depletion of biogenic amines.

> . . . These neurotransmitters are concentrated in the areas of the brain that mediate arousal, sleep, appetite, sex drive, and psychomotor activity, functions impaired in depression. (pp. 20-21)

These authors have proposed, and have presented evidence to support their proposal, that all four of these models enjoy validity, and that they find their common characteristic in a "neurophysiologic final common pathway" (p. 22).

These same authors have pointed out that the classification given in the diagnostic and statistical manual of the American Psychiatric Association (1968) is not satisfactory, because it attempts to classify by etiology a disorder, or set of disorders, whose etiology is really not known (p. 21).

Without, therefore, attempting to provide separate descriptions for endogenous depression, involutional depression, manic depression, neurotic depressive reaction, and so on, since the basis for distinction among these various descriptions is not clear, it seems best to accept a description of the depressive syndrome that incorporates the symptoms common to most or all of the depressive disorders. Akiskal and McKinney (1973) have listed them as psychomotor retardation or agitation, dejection, dysphoria, hopelessness, self-derogation, suicidal preoccupations, insomnia, loss of appetite (anorexia), and loss of libido (pp. 21-22). In addition to these, A. T. Beck

(1967) has mentioned sadness, loneliness, apathy, a negative self-concept associated with self-reproach and self-blame, desire to escape or hide, and change in activity level, either retardation or agitation (p. 6).

Three of the current theories on the etiology of depression have generated recent experimental research. They are A. T. Beck's (1967) theory of negative cognitive set leading to negative perceptions, and to which depressed affective states are secondary; Seligman's (1974, 1975) theory of learned helplessness, leading to passivity; and Lewinsohn's (1974) behavioral theory, which sees behaviors identified as depressive as being due to a low state of response-contingent reinforcement. Blaney (1977) has reviewed much of the research on these theories, as well as the theories themselves. He concluded that (1) "there is considerable overlap among the three theoretical positions," and (2) "the literature does not provide a basis for repudiating any of the three theories or for choosing any of the hypothesized elements--perception, control or rate--as the crucial one in the development of depression" (p. 218).

Depression, therefore, has to be considered as a complex phenomenon or process, both in its etiology and in its observable manifestations.

The process of depression, on the basis of what has

been presented, can be defined as a complex of psychomotor, cognitive, affective, and behavioral events that may be evoked by negative cognitions, learned perceptions of helplessness, including helplessness in the loss of a valued object or person, or by low contingencies of reinforcement. The common factor in the symptoms is negativism. The psychomotor symptoms may be either retarded or agitated.

This is the depression which is expected to interfere with the perceptual process and to produce the Rorschach shading response. The disturbances in the psychomotor system, whether retardation or agitation, are expected to interfere with the eye movements in the scanpaths. The cognitive and affective disturbances, including the apathy mentioned by A. T. Beck (1967, p. 6), are expected to interfere with the eye movements and especially with the internal shifts of attention required for the perceptual process to go to completion in its usual serial fashion.

This depression exists in varying degrees. Clinicians habitually describe patients as slightly, mildly, moderately, or severely depressed, and so on. Therefore, measurement of depression must be on a scale, if it is to correlated with the shading responses. The measurement of depression will be discussed in the following section.

Measurement of the depressive process. Several

instruments have made their appearance for the measurement of depression, including the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; A. T. Beck, 1967), the Zung Self-Rating Depression Scale (Zung, 1974), and several others, including the MMPI Scale 2 (D). Results of the research investigating these measures are mixed. The MMPI Scale 2 (D), though the oldest of the measures, seems to continue to be one of the more reliable.

In a study reported from Royal Ottawa Hospital, Schnurr, Hoaken, and Jarrett (1976) compared five measures of depression with clinical diagnosis. These measures included the MMPI D scale, the Beck Depression Inventory, the Zung Self-Rating Depression Scale, and two rating scales filled out by the psychiatric resident. The greatest correspondence with the clinical diagnosis was found in the MMPI D scale and one of the ratings filled out by the resident.

The MMPI Scale 2 (D) was constructed to measure the symptom cluster of depression (Dahlstrom, Welsh, & Dahlstrom, 1972). The items in the scale are described by Dahlstrom et al. as dealing with "a lack of interest in things, expressed in a general apathy. . . . They describe a feeling of being incapable of performing work satisfactorily or controlling one's thought processes" (p. 184).

The males studied by Hathaway and Meehl (1952) who

scored high on this scale were described as "dissatisfied generally, but particularly self-dissatisfied, as well as emotional, high strung, and prone to worry" (Dahlstrom et al., 1972, p. 188).

Poeldinger, Gehring and Blaser (1973) found that depressives who were high suicide risks scored high on the scale.

These descriptors of the MMPI, Scale 2 are presented in columnar comparison to those used by Akiskal and McKinney and by A. T. Beck in Table 2.

Inspection of the comparison shows that, as with that for anxiety, the correspondence between the MMPI Scale descriptors and the others, though not perfect, is clear.

This correspondence has been confirmed in the research.

In a factor analysis of scores on the MMPI and on the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1971), Newmark, Finch, Faschingbauer, and Kendall (1975) found that MMPI Scale 2 (D) loaded on the same factor as Trait Anxiety, and they interpreted this factor to refelct "rigidity, social alienation, intropunitiveness and worry" (p. 452).

Hedlund (1977) compared the results of seven independent studies, including five previously unreported ones, and encompassing a total of more than 4,000 subjects. He

Table 2

Comparison of Descriptors of Depression

Akiskal & McKinney	A. T. Beck	Descriptors of MMPI items and high scorers from Dahlstrom, Welsh, & Dahlstrom, from Hathaway & Meehl, and from Poeldinger, Gehring, & Blaser
psychomotor retardation	change in activity level	feeling incapable of performing work satisfactorily
dejection	sadness	lack of interest in things prone to worry
dysphoria	apathy	general apathy emotional dissatisfied generally
helplessness	loneliness	feeling incapable of controlling one's feelings
insomnia		high strung
loss of libido		
self derogation	self-reproach desire to escape or hide	self-dissatisfied
hostility turned inwards	self-blame	
suicidal preoccupations		high suicide risks

found that the MMPI Scale 2 (D) correlated positively and significantly with somatic complaints or preoccupation, diarrhea, loss of appetite or weight loss, decreased amount of sleep or insomnia, depressed mood, suicidal thoughts or threats, ideas of worthlessness or self-depreciation, ideas of guilt, ideas of hopelessness or helplessness or both, soft or slowed or reduced amount of speech, decreased motor activity, anxiety or tension or fearfulness, obsessive ideas, phobias and phobic thoughts, anti-authority attitudes, withdrawal or detachment or apathy, passivity or submissiveness or dependence, and emotional lability (p. 742).

In the same study, Hedlund found that MMPI Scale 2 (D) was correlated negatively with denial of illness, hostility or irritability or uncooperativeness, delusions, refusal to speak, inappropriate affect, bizarre behavior or dress, elevated mood, loud or excessive speech, increased motor activity, and flight of ideas (pp. 742-743). He summarized his findings about the D scale by stating that they provide "strong corroboration of the construct validity" (p. 746).

A. T. Beck (1967), in detailing the reasons for the development of his own Depression Inventory, has objected to the D scale of the MMPI on the grounds that it was found by Comrey (1957) to contain a number of heterogeneous factors, only one of which was consistent with Beck's

clinical concept of depression. He also cited the work of O'Connor, Stefic, and Gresock (1957), who "isolated five separate parameters identified as hypochondriasis, cycloid tendency, hostility, inferiority, and depression" (A. T. Beck, 1967, p. 187). For this reason, he questioned "the practice of attributing unitary significance to the D-Scale" (p. 187).

However, he also quotes (pp. 186-187) studies by Lubin (1965) and Nussbaum, Wittig, Hanlon, and Kurland (1963) indicating that his own Depression Inventory correlated higher with the MMPI D scale than with clinical ratings and Lubin's (1965) Depression Adjective Check Lists.

Similarly, Becker (1974), citing Comrey (1957), O'Connor, Stefic, and Gresock (1957), and Dempsey (1963, 1964), noted that the scale has been criticized for its factorial complexity and lack of dimensionality, adding that similar scores on the scale might reflect different depressive states, both qualitatively and quantitatively.

Although these criticisms of the scale are valid, it is the very complexity of the scale that in some ways makes it desirable. Given the complex nature of depression, as indicated previously, it is precisely the broad scope of the depressive symptoms measured by the scale which makes it useful as an indicator of the depressive

process, at least until further research can separate the multi-symptom cluster of clinical depression into its various components, and develop measuring instruments for them. This may well be the reason why the scale, as A. T. Beck has noted (1967, p. 186), has been so widely used for the measurement of depression both for clincial and for research purposes. It is one of the reasons why it is used in the present study.

Anxiety and depression, as explained above, are hypothesized to be active in the production of the Rorschach responses determined primarily by shading. They are hypothesized to do this through the mediation of an intervening variable, a hypothetical construct, which can best be labelled "perceptual apathy."

That this hypothetical construct enjoys the "probability of being in correspondence with the actual events" as demanded by MacCorquodale and Meehl, as quoted above (1948, p. 105), is clear from the evidence cited above for anxiety resulting in disturbances of the autonomic system, disturbances in the motor system, including "freezing," all of which indicate a very high probability of interference with the scanning eye movements involved in perception. Similarly, the evidence cited above for the cognitive symptoms of anxiety, including inattention, distractibility, and forgetfulness, indicate a very high probability of interference with the attention shifts which have

been shown to be a part of the perceptual process.

In like manner, the evidence cited above for depression resulting in psychomotor retardation or agitation, as well as apathy, indicates a high probability of interference with the scanning eye movements; the evidence cited above for depression resulting in dejection, dysphoria, and apathy, indicates a high probability of interference with the attention shifts involved in the perceptual process.

This hypothesized state of "perceptual apathy," of course, is not observable, and is therefore not measurable, as mentioned previously. This problem will be discussed further in the section on the Statement of the Problem.

This section has presented a theory of how the shading responses determined primarily by shading, and only secondarily, or not at all, by Form, are determined by anxiety and depression, through the mediation of a hypothesized "perceptual apathy." The question of those responses which involve shading, but are primarily determined by form, remains to be examined. This will be done in the next section.

Hypothetical Construct for Form Determined Shading Responses

In light of the process of form perception described

above, the formation of shading responses determined primarily by form, and which use shading secondarily, is expected to differ from the formation of responses determined primarily by shading.

Concerning these responses, and how they are produced, Shachtel (1966) observed:

> The quality of attention and sensitivity to the different nuances of shading required for the perception of form determined shading responses finds its parallel, in another area of behavior, in the attention and sensitivity to the emotional overtones and undercurrents in the human environment required if it is important to one to sense or know what the attitude of the other person is. The person who is sensitive to the mood and the unspoken emotional undercurrents in the human environment may be said to have antennae or feelers out to pick up the indications of these undercurrents in physiognomic or gestural expressive manners, in intonations and manner rather than in manifest content of speech, and so forth. (pp. 251-252)

On intuitive grounds, Schachtel's logic seems to be correct. The individual who conforms his visual percepts to the external reality of the stimulus, but also attends to the nuances of the stimulus, is likely to be the person who conforms his perceptions of the environment generally to the external reality of that environment, but without negelecting the more nuanced aspects of it.

What Schachtel has not done, however, is to explain what this "quality" of the individual is, or how it can be identified. Which is another way of saying that he has used a hypothetical construct, and has not identified it.

The task at hand, therefore, is to identify this state or characteristic of the perceiving individual, which is postulated to result in this kind of perceptual behavior. Once this has been done, then the observable and measurable personality factors which have a high probability of being indicators of this construct can be identified.

The form determined shading response is one in which the formation of the Gestalt has reached completion, but in which the information from the earlier stages of perception has been retained and integrated into the final percept. This fact, along with Schachtel's (1966) observations about "the quality of attention and sensitivity to the different nuances of shading required for the perception of form determined shading responses" (p. 251), indicates that the construct to be identified is one of "perceptual sensitivity," i.e., the ability to be sensitive to the nuances and details of the perceived stimulus. It is this same hypothesized trait that Schachtel (1966) sees as active "in another area of behavior, in the attention and sensitivity to the emotional overtones and undercurrents in the human environment" (p. 251).

Like the hypothetical construct of "perceptual apathy" postulated for the pure shading responses, this construct of "perceptual sensitivity" for the form determined shading responses is seen as a mediating variable. It is seen as

mediating between personality factors as independent variables, and the production of the form determined shading responses as the dependent variable. The same inferential leap is involved here, in the relationship between the independent and dependent variables.

The personality factors which can be expected, on the basis of present knowledge, to result in the hypothetically construed interior state, which results in the production of the form determined shading responses, are to be indentified. The likely candidate for this independent variable is intelligence, or at least certain factors in the global factor which is called intelligence, and is measured as such. The next section will discuss this factor, and its measurement.

Intelligence and Its Measurement. In the lengthy and comprehensive review of the history of intelligence testing which makes up the first three chapters of his enlarged edition of Wechsler's Measurement and Appraisal of Adult Intelligence, Matarazzo (1972) returns again and again to the theme that there is no unique ability in the human person which can be labelled as intelligence. Rather, as the history of intelligence testing shows, from the days of Spearman and his two factor theory (1904), up through Guilford and his 120 abilities (Guilford & Hoepfner, 1971), what is being measured by what are called intelligence tests is a variety of abilities. This is one

of the reasons that led Cohen and his associates to devote so much labor to factor analytic studies of the Wechsler scales (Berger, Bernstein, Klein, Cohen, & Lucas, 1964; cf. Matarazzo, 1972, pp. 261-276 for a comprehensive review of this work). Cohen and his colleagues extracted three meaningful factors from the Wechsler Adult Intelligence Scale (WAIS), which they labelled Verbal Comprehension, Percpetual Organization, and Memory/Freedom from Distractibility. Their factor analysis assumed, of course, and confirmed, the additional existence of a general or common factor of intelligence (Spearman's g).

The reader will already have noted the similarity of the Perceptual Organization factor, at least in name, to the hypothesized "perceptual sensitivity," which it is expected to result in. The Wechsler subtests loading highest on this factor were Object Assembly, Block Design, Picture Completion, and Picture Arrangement. Cohen chose the name "Perceptual Organization" for this factor because these subtests are all nonverbal, and require that the examinee interpret and organize test items which must be visually perceived.

This loading of four subtests from the Performance IQ (PIQ) subtests would suggest that it is the PIQ which can chiefly be expected to result in the hypothesized "perceptual sensitivity." But it has already been noted how Schachtel identified social sensitivity as a correlate of

"perceptual sensitivity," even though he did not use the latter phrase. Matarazzo (1972) has cited some 29 studies in which "variously defined adolescent and adult sociopaths" scored higher on PIQ than on Verbal IQ (VIQ). Although these sociopaths were "variously defined," the sociopath is, by whatever definition, precisely the subject most lacking in Schachtel's social sensitivity. Therefore, it is logical to conclude that the VIQ also enters in large part into the hypothesized "perceptual sensitivity," along with the Perceptual Organization factor of Cohen and his colleagues. In fact, their first factor, on which four verbal subtests loaded highly, was identified as Verbal Comprehension, which, at least in the Comprehension and Similarities subtests, implies the kind of attention to subordinate detail that is postulated as leading to the construct of "perceptual sensitivity." Wechsler himself had already indicated some insight into the importance of adequate perception of environmental stimuli and response to them, as seen in the last phrase of his operational definition of intelligence:

> Intelligence, operationally defined, is the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment. (Wechsler, 1958, p. 7)

To summarize, those abilities which are hypothesized to result in what is being construed hypothetically as

"perceptual sensitivity," are among the abilities measured in the WAIS.

Although several differentiated ways of measuring these abilities are involved in certain of the subtests, the differentiation is not complete. As Wechsler and others have pointed out repeatedly (Matarazzo, 1972, pp. 63-90), our measurements of the various abilities comprising measured intelligence contain a great deal of overlap between the various subtests, as well as a mixture of general and specific intelligence.

Therefore, no one individual subtest can be taken as a measure of those abilities hypothesized to enter into "perceptual sensitivity." But the Full Scale IQ (FSIQ) can be used.

In addition, there is another measurement of those factors hypothesized to enter into "perceptual sensitivity" available in the MMPI Scale 5 (Mf). This scale, although originally established to discriminate males of homosexual orientation from others, in fact measures other things. Dahlstrom, Welsh, and Dahlstrom (1976) have noted that among university students classified as "normals," peaks on this scale are the most frequent high points on the profile. Hathaway and Meehl (1952) found that the description of males in the normal population who scored high on this scale, as given by their peers, was that they were sensitive, idealistic, sociable, curious, having

general aesthetic interests. The high scorers on this scale reported by Gough, McKee, and Yandell (1955) were described as valuing cognitive pursuits, deriving important satisfaction from work and achievements, showing a concern with philosophical problems, socially perceptive, responsive to interpersonal nuances, fluent verbally, curious, clear thinking, intelligent. Woodworth, Barron, and MacKinnon (1957) found the scale to correlate positively with personal scope and breadth. In an earlier study by this writer (Vincent, 1973), the scale was found to correlate positively with Rorschach secondary space responses, another instance of the use of nuances, indicating the kind of perceptual ability hypothesized to enter into "perceptual sensitivity," in males.

This scale, therefore, can be accepted as an indicator of the abilities expected to result in "perceptual sensitivity," for males. The meaning of the scale for females is less clear.

Summary

This review of the literature has demonstrated that the use of the Rorschach technique is still widespread, and that psychologists in clinical practice place it first among the tests they recommend be taught to graduate students.

It has also demonstrated that research into the meaning of the shading responses to the Rorschach blots, though abundant, has not led to solid conclusions. It has indicated that the present study is an attempt to follow Frank's advice that more research, but not of the same kind, is needed in this area.

As indicated in this review, most of the research has proceeded from the classical hypothesis among Rorschach systematizers that shading responses "mean" anxiety. Less research has been done into the shading-depression hypothesis, and very little has proceeded from a perceptual foundation.

The various scoring systems for the Rorschach shading responses were reviewed, reflecting the varying definitions of the shading qualities of the blots, and of the shading responses.

The shading qualities of the blots were defined as the variations in lightness and darkness which may in some cases distinguish some inner shapes in the blot from others, and may in some cases cause the blot to have a diffuse, undifferentiated appearance.

The shading response was defined as a response determined by these shading qualities. Exner's system of scoring was selected as the one which corresponds to the definitions used.

The interpretation of the meaning of the shading responses was reviewed, and it was demonstrated that the systematizers used intuitive rationale in following the hypothesis that shading means anxiety. Research into this hypothesis, showing inconsistent results, was reviewed.

Factor analytic studies were reviewed, leading to the conclusion that they gave inconsistent results, that they are all somewhat dated, and that they used less than optimal statistical methods.

A new approach, based on a review of current literature on the nature of perception, and utilizing two new hypothetical constructs, was presented. This approach sees visual perception as a serial process, which is interrupted or interfered with by what is hypothesized to be "perceptual apathy," which in turn is seen as a mediating variable resulting from anxiety or depression or both. It sees this "perceptual apathy" as resulting, because of this interference, in diffuse, undifferentiated percepts, the association to which, when verbalized, becomes the Rorschach shading response determined primarily by shading.

This approach sees the shading response in which form is the primary determinant, and shading is used secondarily, as resulting from what is hypothesized to be "perceptual sensitivity," a construct expected to result from the kind of intelligence which pays attention to nuances, and incorporates them in a meaningful way in perception.

It sees this "perceptual sensitivity" as resulting in a process of perceiving in which the shading qualities of the blot are used as nuances, and incorporated in a meaningful way in the final percept.

The nature of hypothetical constructs and intervening variables was reviewed, pointing out that the use of hypothetical constructs, even though they are not observable and measurable, is legitimate in research, provided that these constructs "have some probability of being in correspondence with the actual events underlying the behavioral phenomena (MacCorquodale & Meehl, 1948, p. 105).

The literature dealing with anxiety as a process was reviewed, along with measures of the process. It was concluded that the MMPI Scale 7 (Pt) is a valid and reliable measure of process anxiety.

Similarly, the literature dealing with depression was reviewed. This led to the conclusion that depression must be seen as a complex process, and that the MMPI Scale 2 (D) is a valid and reliable measure of the process of depression.

The rationale for seeing these two observable and measurable variables as leading to the hypothetical construct of "perceptual apathy," used as an intervening variable was presented.

The literature dealing with intelligence,

particularly that kind of intelligence having to do with perceptual organization, was briefly reviewed. It was concluded that the WAIS FSIQ for both males and females, and the MMPI Scale 5 (Mf) for males, are valid measures of the kind of intelligence that can be expected to enter into the hypothetical construct of "perceptual sensitivity."

The rationale for seeing measurable intelligence as leading to this hypothetical construct, used as an intervening variable, was presented.

Statement of the Problem

Succinctly stated, the research problem confronted in this study is that there has been very little research into the nature of the shading responses to the Rorschach cards and their meaning, that has proceeded from a perceptual viewpoint, and there has been no attempt to elaborate a perception based theory to explain these responses.

In confronting this problem, the present study moves into what is essentially a new area of Rorschach research. Because it is new, there is no previous body of specialized findings to fall back on, and what there is, is largely vitiated by poor statistical methods (cf. Cronbach, 1949; Kalter & Marsden, 1970). The correlational data that must form the basis for validity for any testing technique before new hypotheses can be formed and tested,

has not yet been gathered and published, at least not from a perceptual viewpoint, and not with reliable statistical methods. Therefore, the present research is largely correlational in nature, though not in any simplistic sense.

There has been very little research into the shading responses which distinguished between those determined primarily by shading and those determined primarily be form. Yet, as is clear from the perceptual rationale already presented, these two classes of shading responses are hypothesized to be quite different processes, and to result from different personality factors, through the mediation of different intervening variables.

The problem, therefore, is fourfold:

1. To postulate hypothetical constructs which are credible, i.e., in MacCorquodale's and Meehl's words, "have some probability of being in correspondence with the actual events underlying the behavioral phenomena (p. 105), and which are credibly hypothesized to mediate between the shading responses as the dependent variable, and other variables which can be measured as the independent variables. This is of crucial importance, since the hypothetical constructs cannot be observed, still less measured, and the test of hypothesized relationships must be between the independent and dependent variables.

It is particularly important to see clearly that this kind of theorizing, and the testing which accompanies it, cannot be a definitive test of the validity of the hypothetical constructs. Rather, the most that can be done, and all that is attempted in this research, is to investigate the validity of the empirically observed relationships that exist between the independent variables and the dependent variables, through the hypothesized mediation of the hypothetical constructs as intervening variables. If this investigation establishes the validity of the hypothesized empirical relationships, then the possibility, though not the fact of the validity of the hypothetical construct is established. In the formulation by MacCorquodale and Meehl (1948), "the truth of the empirical laws involved is a necessary but not a sufficient condition for the truth of these conceptions (the hypothetical constructs)" (p. 104).

Therefore, the hypotheses to be tested will not, because they cannot, test the relationship between the independent and intervening variables, nor between the intervening and dependent variables. They can only test the relationships between the measurable variables.

The problem, therefore, is not to test the hypothetical constructs, but to investigate whether, as defined, they have "some probability of being in correspondence with the actual events underlying the behavioral phenomena"

(MacCorquodale & Meehl, 1948, p. 105). If this probability is established, then the hypothetical construct will enjoy sufficient credibility to enter into future research designs and perhaps eventually be subjected to direct testing.

These two hypothetical constructs have already been postulated. They are defined as follows:

"Perceptual apathy" is defined as a state resulting from process anxiety, or depressive process, or both, characterized by psychomotor disturbance and distractibility, resulting in interference with the scanning eye movements and internal attention shifts involved in the process of form perception, and thereby producing shading and shading-form responses as an association to an incompleted Gestalt.

"Perceptual sensitivity" is defined as a trait which is a part of the complex of traits in measured intelligence, characterized by enhanced ability to focus attention and concentration on detail, resulting in the ability to use the nuances of the ink blots, specifically the shading qualities of the blots, in an integrated manner in the final percept, and thereby producing form-shading responses as an association to the nuanced Gestalt.

2. To determine whether the shading responses determined primarily by shading do or do not reflect anxiety or

depression, or both, which would enter into the hypothesized "perceptual apathy."

3. To determine whether the shading responses determined primarily by form do or do not reflect intelligence which would enter into the hypothesized "perceptual sensitivity."

4. To identify the factors defined by the shading responses to the Rorschach cards in conjunction with other scores from three of the most widely used diagnostic tests --Rorschach, WAIS, and MMPI--and to determine the relationships among these defining variables and the shading responses.

All four of these problems are, in the main, theoretical. That is to say, they are concerned directly with the theory of the Rorschach phenomena: what internal perceptual processes happen in the production of shading responses of various kinds, and how these processes are translated into observable external behavior in the responses.

At the same time, all four of these problems are of practical import. That is, they are indirectly concerned with the clinical meaning of the shading respones, as a result of the perceptual processes involved. The interpretation of shading responses in the systems of Rorschach interpretation used in day-to-day clinical practice has been based almost entirely on the systematizers' intuitive

--or at best, informal--conclusions from their own clinical observations, rather than on theoretically elaborated and empirically tested hypotheses. An encouraging development, however, is the Comprehensive System of Exner, which has begun to provide a solid research-based interpretation of these responses, particularly in the consideration of various ratios and combinant scores involving the shading responses, as reported in the second volume of his system (Exner, 1978).

The theoretical answers to the questions posed above, therefore, will lead to practical conclusions for clinical interpretation of the Rorschach protocol of the individual patient or client.

Research Hypotheses

The main hypotheses and subhypotheses are:

1. Individuals who manifest process anxiety or depressive process will give relatively more responses determined primarily by shading, to the Rorschach cards, to the extent that they are anxious or depressed, in the total subject pool of males and females.

   Subhypothesis 1: The proportion of Rorschach responses determined exclusively by shading (T, V, Y) will be positively correlated with MMPI Scale 2 (D), in the total subject pool.

Subhypothesis 2: The proportion of Rorschach T, V, and Y responses will be positively correlated with MMPI Scale 7 (Pt), in the total subject pool.

Subhypothesis 3: The proportion of Rorschach responses determined primarily by shading, but also incorporating the use of Form (TF, VF, YF) will be positively correlated with MMPI Scales 2 (D) and 7 (Pt), but the correlation will be lower than that between the proportion of T, V, and Y and these scales, in the total subject pool.

Subhypothesis 4: The mean score on MMPI Scales 2 (D) and 7 (Pt) will be higher for those individuals giving more T, V, and Y than TF, VF, and YF Rorschach responses, than for those giving more TF, VF, and YF than T, V, and Y responses, in the total subject pool.

2. Individuals who manifest higher measured intelligence will give relatively more shading responses determined primarily by form, to the Rorschach cards.

Subhypothesis 6: The proportion of Rorschach shading responses determined primarily by Form will (FT, FV, and FY) will be correlated positively with the WAIS FSIQ, in the total subject pool.

Subhypothesis 7: The proportion of Rorschach FT, FV, and FY responses will be correlated positively with the proportion of secondary space responses, in the total subject pool.

Subhypothesis 8: The proportion of Rorschach FT, FV, and FY responses will be correlated positively with MMPI Scale 5 (Mf), for males.

3. The proportion of Rorschach FT, FV, and FY responses will not be correlated with the Rorschach T, V, Y, TF, VF, and YF responses.

4. The set of scores on the WAIS FSIQ and the MMPI, and the set of Rorschach scores will be canonically

correlated by a pair of canonical variates partially defined by the WAIS FSIQ from the first set and by the Rorschach FT, FV, and FY responses from the second set.

5. There will be an analytic factor partially defined positively by MMPI Scale 2 (D), MMPI Scale 7 (Pt), and Rorschach T, V, Y, TF, VF, and YF scores.
6. There will be an analytic factor partially defined positively by the WAIS FSIQ, Rorschach secondary space response scores, and Rorschach FT, FV, and FY scores.

CHAPTER II

METHOD

Subjects

For the purpose of this research, it was considered important that the Rorschach protocols used should be obtained in a clinical setting, so that the external variables surrounding the testing situation should be as similar as possible to those usually found in the administration of the test. This consideration determined the method of obtaining subjects.

All records containing the three tests used in the research, for subjects between the ages of 21 and 50 years, and not having a diagnosis of psychosis, were selected from the files of a psychological clinic. There were 149 such records available. The lower age limit was imposed to exclude any developmental phenomena from the Rorschach protocols. The upper limit was imposed to rule out any possibility of senile processes. Subjects with diagnosis of psychotic process were excluded to rule out any possibility of hallucinatory phenomena.

A breakdown of the subjects by age is presented in Table 3. Table 4 presents a breakdown by age and sex. Means and standard deviations of the IQ scores are shown in Table 5. Table 6 shows the means and standard

Table 3

Cumulative Frequencies and Cumulative Percentages for the Distribution of the Ages of Subjects

Age	Frequency	Cumulative Frequency	Cumulative Percentage
41-50	14	149	100.0
36-40	10	135	90.6
31-35	15	125	83.9
26-30	32	110	73.8
21-25	78	78	52.3
Total	149		

Table 4

Means, Standard Deviations, and Medians of Ages of Subjects

	Males (n = 85)	Females (n = 64)	All Subjects (n = 149)
Mean Age (Years)	26.88	29.09	27.83
Stand. Dev.	7.36	7.51	7.48
Median Age (Years)	24.06	27.64	25.11

Table 5

Means and Standard Deviations of IQ Scores

	Males (n = 85)	Females (n = 64)	All Subjects (n = 149)
Mean IQ	115.14	112.38	113.95
Stand. Dev.	10.41	11.50	10.94

Table 6

Means and Standard Deviations of MMPI Scores

	MMPI Scale	Males (n = 85)	Females (n = 64)	All Subjects (n = 149)
M	L	48.059	50.016	48.899
SD		6.833	8.217	7.547
M	F	62.376	60.000	61.356
SD		10.412	9.316	10.059
M	K	50.612	52.375	51.369
SD		9.461	7.777	8.850
M	1 (Hs)	57.129	55.266	56.329
SD		12.472	9.365	11.512
M	2 (D)	70.294	66.499	68.651
SD		15.599	12.355	14.377
M	3 (Hy)	62.494	61.906	62.242
SD		10.904	11.698	11.217
M	4 (Pd)	67.600	66.734	67.228
SD		11.840	11.074	11.487
M	5 (Mf)	68.494	44.992	---[a]
SD		9.676	9.887	
M	6 (Pa)	60.776	62.219	61.396
SD		10.375	9.939	10.391
M	7 (Pt)	71.247	66.328	69.134
SD		13.753	10.969	12.827
M	8 (Sc)	71.141	67.226	69.477
SD		17.030	12.893	15.462
M	9 (Ma)	59.941	58.422	59.289
SD		12.140	9.958	11.244
M	0 (Si)	58.329	61.516	59.198
SD		11.417	11.914	11.700

[a]Scale 5 scores for males and females not comparable

deviations of T-scores on the MMPI.

Setting

The three tests used in the research, WAIS, MMPI, and Rorschach, were administered to the subjects as part of the diagnostic procedure by members of the staff at the clinic, including interns working under professional supervision. All tests were administered in the offices of the clinic. In some cases, the administration of the Rorschach was observed through a one-way glass by a supervisor, when administration was by an intern. It was not possible to determine which individuals were tested under these conditions, and which were not.

Instruments

Scores from three tests were used, the WAIS, the MMPI, and the Rorschach.

Wechsler Adult Intelligence Scale (WAIS)

Wechsler (1939) followed four procedures before deciding on the tests to be included in the Wechsler-Bellevue Scale, the forerunner of the WAIS: (1) an analysis of the standardized tests already in use, (2) an evaluation of validity of these tests on the basis of correlations with other recognized tests and with empirical ratings of intelligence, (3) rating the tests on the basis of his own

clinical experience and that of others, and (4) some two years of experimentation with the various likely subtests. Final selection of the subtests was based on three considerations: (1) reasonable correlation with composite measures of intelligence, (2) sufficient diversity of function, and (3) diagnostic potential of the nature and character of failures. The Scale was standardized on 1750 subjects of both sexes, aged 7 to 69, in the United States.

The revision of the Wechsler-Bellevue; the WAIS (Wechsler, 1955), was based on similar considerations, along with the vast experience accumulated in the use of the Wechsler-Bellevue Scale. It contains 11 subtests, from which the VIQ and PIQ are derived, and all of which enter the derivation of the FSIQ. The six verbal subtests are Information, Comprehension, Arithmetic, Similarities, Digit Span, and Vocabulary. The five performance subtests are Digit Symbol, Picture Completion, Block Design, Picture Arrangement, and Object Assembly.

Perhaps the most distinguishing characteristic of the Wechsler Scales is the derivation of the IQ by comparison to the mean and standard deviation of the standardization sample, rather than through the concept of mental age. The mean for the standardization is set at 100, with a standard deviation of 15.

The WAIS was standardized on a sample of 1700 subjects, of both sexes, aged 16 to 64, with an additional

352 subjects of both sexes, aged 60 to 75 years and over, in the United States. Detailed demographic description of the standardization sample is given in the Test Manual (Wechsler, 1955).

The validity and reliability of the test are generally accepted and its acceptance is indicated in the study by Wade, Baker, Morton, and Baker (1979) cited in the Introduction.

Minnesota Multiphasic Personality Inventory (MMPI)

The MMPI was first introduced in 1943 by Hathaway and McKinley. Over a period of several years, the test was revised somewhat, and new scales were added, until it reached its present form (Hathaway & McKinley, 1967). It consists in its final form of four validity scales and ten clinical scales. The validity scales are L (or "Lie"), excessively high scores on which invalidate the test; F, which measures, among other things, self-deprecation, and excessively high scores on which also invalidate the test; K, which was designed as a "suppresor" or correction variable--certain percentages of the K score are added to certain clinical scale scores as corrections; and the ? or "cannot say" score, which is a count of the unanswered items in the total of 499.

The clinical scales, which are sometimes referred to by number, and sometimes by their name code, are 1 (Hs),

designed to measure hypochondriasis; 2 (D), designed to measure the clinical entity of depression; 3 (Hy), designed to measure what was considered at the time the test was originated as hysteria; 4 (Pd), designed to measure what was considered at that time to be psychopathic deviation; 5 (Mf), designed to identify males of homosexual orientation, and measured in the opposite direction on the scoring profile for females; 6 (Pa), designed to measure paranoia; 7 (Pt), designed to measure psychasthenia according to the concept in use at the time the scale was elaborated; 8 (Sc), designed to measure the clinical symptoms of schizophrenia; 9 (Ma) designed to measure mania, and 0 (Si), designed to measure social introversion.

The 499 items which made up the final form of the test after several trials with a larger number of items, were administered to groups diagnosed as falling into the various clinical categories of the clinical scales. Items which 80 percent of the clinical group answered in one direction (true or false) and which 80 percent of the control group answered in the other direction, were included in the published scoring scales of the test. The clinical groups were of varying sizes. The control group, the "normals," were chosen from several sources; details of the demographic descriptions of the various groups are given by Dahlstrom, Welsh, and Dahlstrom (1972).

Based on the scores of the standardization group,

transformation of the raw scores, after correction through addition of a certain percentage of the K score on certain scales, into T-scores, with a mean of 50 and a standard deviation of 10, are made, and the scores then plotted on a profile.

The MMPI is widely regarded as a reliable and valid measure of various clinical entities; it is widely used in research; and the previously cited study by Wade, Baker, Morton, and Baker, indicates its widespread use. Use of Scale 2 (D) as a measure of the process of depression, of Scale 5 (Mf) as a measure of perceptual sensitivity in males, and of Scale 7 (Pt) as a measure of process anxiety was discussed in Chapter I.

The Rorschach

The Rorschach "test," though one of the most widely used, is emphatically not standardized. The chief reason for this is a historical one. Soon after Rorschach's untimely death, various workers began to work out their own systems of using the technique, based only partly on what little Rorschach had written. Exner (1974) has capsulized the present situation in regard to this:

> It is true that there are the 10 Swiss inkblots about which Rorschach published his original treatise, and it is also true that many of Rorschach's postulates have formed the basis on which specific systems have been developed. But it is not true that the various Rorschach systems

> are highly congruent. Quite the contrary, they are substantially different. In the United States alone there have been at least five such methods or systems developed. These five systems, Beck, Hertz, Klopfer, Piotrowski, and Rapaport-Schafer, differ enormously--not so much that each is completely discrete from each of the others, but enough so that five different Rorschach tests have been created. (p. 7)

It may be unfortunate that Exner's (1974) systhesis of the various systems has arrived somewhat late in the Rorschach day, as Stricker (1976) noted in his review of Exner's book. But, fortunately, it has arrived. As Stricker also noted,

> in the past Exner has compared the formal systems, showing the commonalities and divergencies that exist. This book represents the next logical step, which is the construction of a single comprehensive system that draws upon existing work and knowledge wherever possible. . . . The overall product is logical and the potential value of a comprehensive system is compelling. (p. 24)

Therefore, the Exner system of scoring was used in the present study, and his system considered the authority for interpretation.

The Exner system, like all the others, involves a fairly complex scoring system. It includes, besides a score for the total number of responses, 6 location scores, 22 determinant scores, 27 content scores, 4 developmental quality scores used with location scores, 8 form quality scores, 2 organizational activity scores, 1 score for the number of popular responses, 1 score for "pair" responses. All these scores are tabulated as an arithmetic count of

the number of responses with the particular score. In addition, there are 23 ratios, percentages, and derivations from the scores. The total number of variables measured and scored, therefore, is 94. Not all these variables need be included in every research design. For example, all content scores can be collapsed, and the number of different content categories used reported as one score. Certain other reductions in the number of variables used in statistical analysis are also possible.

Validity and reliability coefficients for the Rorschach, regardless of the system used for administration, scoring, and interpretation, cannot be given, since there has not yet been any agreement on how to obtain them.

Procedure

Records of the 149 outpatients of the clinic, between the ages of 21 and 50, who were not diagnosed as psychotic, and who were administered the three tests, as described above in the section on Subjects, were selected. The maximum time between the administration of the first and the last of the three tests was one month. For each subject, age and sex were recorded. The records indicated that the order of the tests varied somewhat, but generally the WAIS was administered first, followed by the MMPI, with the Rorschach at the end. The WAIS was administered in standard fashion. The MMPI was administered in the

booklet form, with the answers to the items marked on the form readable by scoring stencils. The Rorschach was administered in the manner recommended by Klopfer, with some minor variations among the testers.

WAIS scores. Scores for the WAIS FSIQ were recorded for each subject, with the subjects coded by number rather than by name.

MMPI scores. Scores for the MMPI scales were recorded, except for the ? or "cannot say" scale, since no records were encountered in which the ? score exceeded 10. The T-scores (after K corrections) were recorded for the clinical scales.

Rorschach scores. The Rorschach protocols were rescored by the writer, using the Exner system, and the scores recorded, without attention to the WAIS or MMPI scores. Two exceptions were made to the Exner scoring system.

One exception to Exner's system was made in the scoring of the space responses. Although Exner (1974) scores all space responses in the same way, with the symbol S added to the location score, this does not seem warranted. Bandura (1954) attempted to establish a relationship between the two types of space responses: primary, in which there is a figure-ground reversal, and secondary, in which the interior or exterior white spaces are used as a secondary determinant. He found no relationship between the

two. Fonda (1951) had found the same results in an earlier study. The present writer (Vincent, 1973) again confirmed these findings. This last mentioned study found that the secondary space responses appeared to be highly related to intelligence, and they are taken in the present study to be a measure of intelligence. Hence, the two categories of space responses were scored separately, and coded PS, for primary space responses, in which there is a reversal of figure and ground, and SS, for secondary space responses, in which there is no figure-ground reversal, but in which the white space or spaces are used as a secondary determinant, or nuance.

The other exception was to use only one category for content, consisting of a count of the number of content categories used by each subject.

Movement responses were not scored as active or passive, because some of the protocols did not contain enough information for this scoring.

Although all the other Exner categories were scored, including ratios and derivations, not all were incorporated into the experimental design. In order to avoid problems of index correlations, as well as confounding of meaning between identical ratios with differing numerators and denominators, ratios and percentages were omitted from analysis. Only the response categories (location, determinant, and content scores), and the total number of

responses, were used for analysis.

The Rorschach variables used, with the scoring symbols from Exner (except for the space responses), are shown in Table 7. These variables will henceforth be referred to by their symbols.

There were several problems to be faced in the analysis of the Rorschach responses. These are described, and the solution presented, in the next section.

Rorschach Score Analysis Problems. One of the problems in the statistical analysis of Rorschach scores is the varying number of total responses. It has been pointed out repeatedly that a total of 5 W responses, for example, out of a total of 7 R, cannot be taken to have the same meaning as 5 W in a total of 40 R. While this problem is solved in clinical work by the clinician being aware of the difference in meaning, and drawing his conclusions through a more or less intuitive interpretation of this fact, the problem is less easily resolved in the area of statistical analysis.

In the first place, almost all Rorschach score distributions are skewed, usually positively, and markedly so. This skewness, unless corrected, plays havoc with the computation of correlations, imposing spurious upper limits in the case of positive skewness (cf. McNemar, 1969, pp. 186-187).

Table 7

Rorschach Scoring Categories and Symbols

Scoring Categories	Symbols
Number of responses	R
Location scores:	
Whole	W
Common Detail	D
Unusual Detail	Dd
Primary Space	PS
Secondary Space	SS
Confabulated Whole[a]	DW, DdW
Confabulated Detail[a]	DdD
Determinant scores:	
Human Movement	M
Animal Movement	FM
Inanimate Movement	m
Pure Color	C
Color-Form	CF
Form-Color	FC
Color Naming[a]	Cn
Pure Achromatic Color	C'
Achromatic Color-Form	C'F
Form-Achromatic Color	FC'
Pure Texture	T
Texture-Form	TF
Form-Texture	FT
Pure Vista[a]	V
Vista-Form	VF
Form-Vista	FV

Table 7 (Continued)

Rorschach Scoring Categories and Symbols

Scoring Categories	Symbols
Pure Diffuse Shading	Y
Diffuse Shading-Form	YF
Form-Diffuse Shading	FY
Form-Dimensionality	FD
Pair	(2)
Reflection-Form	rF
Form-Reflection	Fr
Form	F
Content	Ct

[a]None of these responses occurred in the protocols under study.

In the second place, even if the problem of skewness is overcome by the use of normalized T-scores, as McNemar and others recommend, the problem of the relationship between the various response categories and the total number of responses remains. To return to the previous example, normalizing a W response distribution for a number of subjects leaves untouched the problem of the difference in meaning of the 5 W out of a total of 7 R and the 5 W in a total of 40 R.

A solution frequently adopted has been to analyze the response scores for each Rorschach variable in terms of a proportion of the total score, for each subject. As early as 1949, Cronbach had called attention to the problems involved in this approach (Cronbach, 1949, pp. 411-417). The chief problem is that identical ratios may not have identical meaning. For example, a score of 5 W in a total of 10 R yields the same ratio as a score of 15 W in a total of 30 R; there is no evidence that the two have the same meaning, and, in fact, there is considerable evidence that they do not have the same meaning. Another difficulty with ratio scores, not expanded on by Cronbach in his 1949 article, is a statistical one, that of spurious correlation due to indices. Since the appearance of Cronbach's article, the use of such ratios in published Rorschach research has declined, but has by no means disappeared. In 1970, Kalter and Marsden published a study

again attacking the problem, in which they observed that "a search of only two journals over a five-year period revealed ten instances of attempts to control for R by this method" (p. 11).

However, the method suggested by Kalter and Marsden, that of subtracting the Rorschach variable score from R, resulting, in the case of W, in a new variable, R - W, and then obtaining correlations, still does not solve the problem of the different meanings of the same score on W for differing totals of R.

Cronbach's suggestion to divide experimental groups into high and low scorers on whatever Rorschach variable is under investigation, and performing whatever statistical analysis is appropriate, usually a chi-square analysis, leave the problem of obtaining the actual product-moment correlations still unsolved.

Another method used by some researchers has been to "partial out" the influence of R through the use of partial and part correlation. Obtaining a correlation between two Rorschach variables, or a Rorschach variable and some other variable, "with R held constant," sounds plausible. Upon closer inspection, however, this, too, is unsatisfactory, because it overlooks the spurious index correlation between the two Rorschach variables, due to the implied common denominator, and it assumes that the

relationship of the given variable to R is one of linear regression, which is almost certainly not the case.

There is a method of adjusting correlations between variables which are subsets and the set of which the subsets are parts--index correlations. This formula, however, involves the coefficient of variation, v (v = S/M), and, as McNemar (1969) remarks, its use "leads to serious error when the vs are large--v^3 and higher-power terms having been dropped in the derivations" (p. 180). Moreover, the use of correlations adjusted in this fashion in a matrix to be submitted to factor analysis raises questions. And it still leaves unsolved the problem of the different meaning of the same score on a Rorschach variable in two protocols with differing R.

Since none of the methods reported in the literature is satisfactory, a new method was used for the present study.

Method of controlling for R. There are three problems involved in distributions of scores on the Rorschach variables, with respect to R:

1. Obtaining normal or near normal distributions; almost all Rorschach score distributions are notoriously skewed, usually positively.

2. Obtaining distributions that reflect the different meanings of identical scores in protocols of differing length.

3. Obtaining distributions that are not indexed to R and not correlated with R.

These three problems were attacked through the following procedure.

The protocols were divided, as nearly equally as possible, into ten groups, according to the number of R in each protocol. The resulting distribution of protocols is shown in Table 8. For each group of protocols, a frequency distribution was constructed for each of the Rorschach variables under study. Using these frequency distributions, the scores on each variable within each group were transformed into normalized T-scores, with mean of 50 and a standard deviation of 10.

In making these distributions, the three color responses, C, CF, and FC, were weighted and combined into one score, coded Co, for Color. This was done because of the relatively large number of 0 scores in each of these categories taken separately. The weighting formula was that recommended by Rorschach (1942): $Co = 1.5C + CF + 0.5FC$.

Similarly, the three achromatic color responses, C', C'F, and FC', were combined into one category, coded Acco, for Achromatic Color, because of the large number of 0 scores in each of these categories. They were not weighted.

For the same reason, the reflection scores--Exner's

Table 8

Grouping of Rorschach Protocols According to Number of Responses

Group	R	Number of Protocols
1	7-10	11
2	11-12	14
3	13-14	16
4	15-17	12
5	18-20	19
6	21-22	15
7	23-27	17
8	28-31	13
9	32-40	16
10	41-145	16
	Total	149

rF and Fr--and the pair scores--Exner's (2)--were weighted and combined into one score, coded Egc, for Egocentricity, as recommended by Exner (1974), whose formula was used in weighting: Egc = 3(Fr + rf) + (2).

Finally, the R scores, which were skewed positively, were transformed into normalized T-scores, for the entire subject pool.

These transformations yielded, for the entire pool of protocols, a distribution of scores on each Rorschach variable which was very nearly normal, in which the difference in R was accounted for in each distribution, and in which there was no indexing to R.

Ideally, normalized T-scores would be constructed in this fashion for each score on R, in order to account as fully as possible for the different meanings of scores on other variables in protocols of varying R. This was not possible in the present study, because there were too few protocols. Although some accuracy of information may have been lost by using groupings of protocols, it is felt that this loss is negligible, expecially when compared to the advantages gained in achieving normality, accounting for R, and in avoiding indexing.

Although square-root transformations are recommended for skewed distributions for conversion to normality (Kirk, 1968, pp. 63-67), the R scores were normalized into

T-scores instead, because the square-root transformation is more suitable to distributions in which the count is small (Bartlett, 1936, 1947).

Statistical Procedures

Hypothesis 1, including subhypotheses 1-5; hypothesis 2, including subhypotheses 6-8; and hypothesis 3, were tested through classical hypothesis testing of the corresponding null hypotheses.

Hypothesis 4 was tested through canonical correlation with its corresponding test of significance.

Hypotheses 5 and 6 were tested through factor analysis and interpretation of the extracted factors.

In the classical hypothesis testing, the level of significance (α) was set at .01, or $1 - \alpha = .99$. Although raising the significance level from the usual .05 increases the probability of type II error--failing to reject the null hypothesis when it is in fact false (McNemar, 1969; pp. 65-72)--two considerations led to the choice of the more stringent level.

In view of the multitude of contradictory findings that have been published concerning the meaning of Rorschach variables, as mentioned in the Introduction and in Chapter I, caution is in order, in accepting hypothesized relationships among Rorschach variables, and between these

variables and other measures of personality. It seems better, under these circumstances, to run the increased risk of type II error in order to decrease the probability of type I error--rejecting the null hypothesis when it is in fact true.

The other consideration that led to this decision is a statistical one. A significance level is usually thought of in terms of the probability of the test yielding a significant result by chance in a specified number of random samples. But there is another consideration. Cronbach (1949) pointed out that

> If a particular critical ratio or chi-square or t-test corresponds to a P of .05, we conventionally interpret that as statistically significant because "such a value would arise by chance only once in twenty times." While this usually refers to once-in-twenty samples, it may also be thought of as "once in twenty significance tests," if the several tests are independent. (pp. 399-400)

He went on to point out further that a number of significance tests are forgotten about, because they are not computed, either because they do not pertain to the study at hand, or for some other reason, such as visual inspection of the data leading to a decision not to bother conducting the tests. But the tests are still among those that could be conducted on the same set of data. This leads to inflated probabilities.

As an example, there are 31 variables considered in this study. A correlation coefficient can be computed

between each pair of variables, and tests conducted. Each test would be independent. This would result in 465 correlations and significance tests. If a significance level of .05 were chosen, then "significant" results could be expected on the basis of chance alone, in 23 of the tests, before even considering the possibility of results due to sampling probabilities.

The price to pay for this "inflation" of probabilities, as Cronbach also made clear, is to make the alpha level more stringent. It is true that this in turn inflates the probability of type II error. But the price to be paid for this second inflation is increased sample size, not a less stringent significance level.

Tests of Hypotheses

For testing subhypotheses 1, 2, 3, 6, 7, and 8, product-moment correlations were computed and tested for significance. The correlations were computed by the usual formula

$$r = \frac{\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{\{\Sigma X^2 - (\Sigma X)^2/N\}\{\Sigma Y^2 - (\Sigma Y)^2/N\}}}$$

The hypothesis test used was

H_0: $\rho = 0$. H_1: $\rho > 0$.

One tailed test

$\alpha = .01$

Statistic: t

$$\underline{t} = \underline{r}\sqrt{(\underline{N} - 2)/(1 - r^2)} \quad .$$

$$\underline{df} = \underline{N} - 2$$

Reject H_0 if $\underline{t} > \underline{t}_{1 - \alpha, \underline{df}}$;
tentatively accept H_1.

Do not reject H_0 if $\underline{t} \leq \underline{t}_{1 - \alpha, \underline{df}}$.

For subhypothesis 3, the test of differences between the correlations was that recommended by Dayhaw (1969) for testing the difference between two correlations which have one array, or one variable, in common. The hypothesis test used was:

$H_0: \rho_1 = \rho_2$. $H_1: \rho_1 > \rho_2$.

One tailed test.

Statistic: $\underline{Z}$, where $\underline{z}$ is Fisher's (1951) $\underline{r}$ to $\underline{z}$ transformation:

$$\underline{z} = 1.1413 \log_{10} \frac{1 + \underline{r}}{1 - \underline{r}} \quad \text{and}$$

$$\underline{Z} = \frac{\underline{z}_1 - \underline{z}_2}{\sigma_{\underline{z}_1 - \underline{z}_2}}$$

where $\sigma_{\underline{z}_1 - \underline{z}_2}$ is Dayhaw's standard error of the difference between the two $\underline{z}$s, given by

$$\sigma_{\underline{z}_1 - \underline{z}_2} = \sqrt{\frac{2 - 2\underline{r}_{zz}}{\underline{N} - 3}}$$

in which $\underline{r}_{zz}$ is the correlation of

correlations with one variable in common, given by Pearson and Filon as:

$$\underline{r}_{\underline{r}_{12}\underline{r}_{13}} = \frac{\underline{r}_{23} - \underline{r}_{12}\underline{r}_{13}(1 - \underline{r}^2_{23} - \underline{r}^2_{12} - \underline{r}^2_{13} + 2\underline{r}_{12}\underline{r}_{13}\underline{r}_{23})}{2(1 - \underline{r}^2_{12})(1 - \underline{r}^2_{13})}$$

$\underline{df} = \underline{N} - 3.$

Reject H_0 if $\underline{Z} > \underline{z}_{1-\alpha, \underline{df}}$

tentatively accept H_1.

Do not reject H_0 if $\underline{Z} \leq \underline{z}_{1-\alpha, \underline{df}}$

Subhypotheses 4 and 5 were tested for the difference between means in the two groups. The hypothesis test used was

$H_0: \mu_1 = \mu_2$. $H_1: \mu_1 > \mu_2$.

One tailed test

$\alpha = .01$

Statistic: $\underline{t}$

$$\underline{t} = \frac{\underline{M}_1 - \underline{M}_2}{\sqrt{\frac{\underline{s}^2}{\underline{N}_1} + \frac{\underline{s}^2}{\underline{N}_2}}}$$

where $\underline{s}^2$ is the estimate of common variance:

$$\underline{s}^2 = \frac{\Sigma(\underline{X}_1 - \underline{M}_1)^2 + \Sigma(\underline{X}_2 - \underline{M}_2)^2}{\underline{N}_1 + \underline{N}_2 - 2}$$

$\underline{df} = \underline{N}_1 + \underline{N}_2 - 2.$

Reject H_0 if $\underline{t} > \underline{t}_{1-\alpha, \underline{df}}$;

tentatively accept H

Do not reject H_0 if $\underline{t} \leq \underline{t}_{1-\alpha,\ df}$.

For hypothesis 4, computer calculated canonical correlations were obtained for the IQ and MMPI scores (except for Scale 5 (Mf), scores on which are not compatible between males and females), as the first set, and scores on the Rorschach variables, as the second set. Significance of the correlations was tested through the use of Bartlett's transformation, for which, if $\underline{k}$ canonical correlations have been tentatively accepted as non-zero, the criterion for testing that the others are zero is defined (Kendall & Stuart, 1966, p. 291) as:

$$-\{\underline{n} - 1 - \underline{k} - \tfrac{1}{2}(\underline{p} + \underline{q} + 1) + \sum_{j=1}^{k} \underline{r}_j^{-2}\} \log \prod_{\underline{j}=\underline{k}+1}^{p} (1 - \underline{r}_j^2)$$

which is distributed approximately as chi-square, with $(\underline{p} - \underline{k})(\underline{q} - \underline{k})$ degrees of freedom. The Bartlett's transformations were also computer calculated. The significance test used was:

H_0: $\rho = 0$. H_1: $\rho > 0$.

$\alpha = .01$

Statistic: χ^2

$\underline{df} = (\underline{p} - \underline{k})(\underline{q} - \underline{k})$ where $\underline{p}$ is the number of variables in the smaller set and $\underline{q}$ is the number of variables in the larger set

Reject H_0 if $\chi^2 > \chi^2_{1-\alpha, df}$;

tentatively accept H_1.

Do not reject H_0 if $\chi^2 \leq \chi^2_{1-\alpha, df}$.

Computer caluculations of canonical correlation, and of the chi-square values, was done through the CANCORR subprogram of the SPSS program package (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

Hypotheses 5 and 6 were tested by extracting factors through factor analysis. Since there were no assumptions of unique variance in any of the variables under study, factors were extracted through the method of principal components. The matrix of correlations of all the variables was entered into the analysis with unities in the main diagonal of the matrix. This resulted in the initial extraction of a number of components (factors) equal to the number of variables. Those with an eigenvalue of 1.0 or greater were retained for further analysis. In order to simplify the factor structure as far as possible, the remaining factors were rotated by Varimax rotation, which is designed to simplify the columns of the matrix (Kim, 1975).

For the interpretation of the factors, and the test of hypotheses 5 and 6, following the suggestion of Nunnally (1970), those variables with a loading greater than .30 (+ or -) were considered as defining a factor.

Computer extraction of factors, computation of

associated statistics, and rotation, were done through the FACTOR subprogram of the SPSS program package (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

For the canonical correlation analysis and the factor analysis, in order to reduce the number of variables with 0 scores and thus to obtain more variability in the T-score distributions, several variables were combined. All shading responses determined exclusively or primarily by shading (T, V, Y, TF, VF, YF) were combined into one scoring category, coded Sh, for shading. A new series of frequency distributions, according to the groupings of the protocols by number of R, was constructed, and normalized T-scores obrained for this new scoring category.

Similarly, all shading responses in which form was the primary determinant (FT, FV, and FY) were combined into one category, coded Fsh, for form-shading. Again, a new set of frequency distributions was constructed, and the scores transformed into normalized T-scores in the manner already described.

The results of these procedures are presented in the following chapter.

CHAPTER III

RESULTS

This chapter presents the results of the statistical analyses carried out on the data, and the results of the hypothesis tests conducted with these results.

Subhypothesis 1. The obtained correlation between the proportion of Rorschach responses determined exclusively be shading (T, V, Y), using the normalized T-scores for this combined group of responses, and the scores on MMPI Scale 2 (D), was .012. This result is shown in Table 9. The correlation was not significant, t (147) = .145, p = .442. The null hypothesis could not be rejected. The subhypothesis was not supported.

Subhypothesis 2. The obtained correlation between the proportion of Rorschach responses determined exclusively be shading (T, V, and Y), using the normalized T-scores for this combined group of responses, and the scores on MMPI Scale 7 (Pt), was -.0364. This result is shown in Table 9. The correlation was not significant, t (147) = .442, p = .33. The null hypothesis could not be rejected. The subhypothesis was not supported.

Subhypothesis 3. The obtained correlation between the proportion of Rorschach responses determined primarily

Table 9

Correlations between Shading Responses and MMPI Scales

(n = 149)

	MMPI Scale 2 (D) M = 68.65 SD = 14.38	MMPI Scale 7 (Pt) M = 69.13 SD = 12.83
T + V + Y M = 50.01 SD = 4.23	.0120	-.0364
TF + VF + YF M = 50.30 SD = 7.74	.1005	.1369

by shading, but also incorporating the use of form (TF, VF, and YF), using the normalized T-scores for this combined group of responses, and the scores on MMPI Scale 2 (D), was .1005. This result is shown in Table 9. The correlation was not significant, t (147) = 1.225, p = .111. The null hypothesis could not be rejected. This part of the subhypothesis was not supported.

The obtained correlation between the proportion of Rorschach responses determined primarily by shading, but also incorporating the use of form (TF, VF, and YF), using the normalized T-scores for this combined group of responses, and the scores on MMPI Scale 7 (Pt), was .1369. This result is shown in Table 9. The correlation was not significant, t (147) = 1.676, p = .048. The null hypothesis could not be rejected. This part of the subhypothesis was not supported.

The test for the difference between the correlation of MMPI Scale 2 (D) with combined T, V, and Y scores, and that with combined TF, VF, and YF yielded significant results, z = 4.772, $p < .001$. However, this result is meaningless, since the correlations themselves were not significant.

The same was true for the test of difference between the correlation of MMPI Scale 7 (Pt) with combined T, V, and Y responses, and that with combined TF, VF, and YF responses, in which z = 1.276, $p < .102$. Moreover, the

difference between the correlations was not in the expected direction. The reasons for this will be discussed in the next chapter. The null hypothesis could not be rejected. This part of the subhypothesis was not supported.

Subhypothesis 4. The mean score on MMPI Scale 2 (D) for those individuals giving more T, V, and Y Rorschach responses than TF, VF, and YF responses, was 85. The mean score for those giving more TF, VF, and YF than T, V, and Y responses, was 69.672. These results are shown in Table 10. The difference between the means was not significant, t (67) = 1.521, $p < .075$, although the difference was in the expected direction. The reasons for this will be discussed in the next chapter. The null hypothesis could not be rejected. This part of the subhypothesis was not supported.

The mean score on MMPI Scale 7 (Pt) for those individuals giving more T, V, and Y Rorschach responses than TF, VF, and YF responses was 85.5 The mean score for those giving more TF, VF, and YF than T, V, and Y responses, was 71.672. These results are shown in Table 10. The difference between the means was not significant, t (67) = 1.528, $p < .075$, although the difference was again in the expected direction. The reasons for this will be discussed in the next chapter. The null hypothesis could not

Table 10

Mean MMPI Scores for Rorschach Response Groups

Rorschach[a] Response Groups	Mean MMPI Scores	
	Scale 2 (D)	Scale 7 (Pt)
Sh > Shf (n = 2)	85.000 SD = 9.899	85.000 SD = 16.263
Shf > Sh (n = 67)	69.672 SD = 14.095	71.672 SD = 12.551
(Sh + Shf) > 0 (n = 72)	70.042 SD = 13.917	71.611 SD = 12.717
(Sh + Shf) = 0 (n = 77)	67.351 SD = 14.766	66.818 SD = 12.573

[a] Sh = T + V + Y

Shf = TF + VF + YF

be rejected. This part of the subhypothesis was not supported.

Subhypothesis 5. The mean score on the MMPI Scale 2 (D) for those individuals giving at least one T, V, Y, TF. VF or YF Rorschach response was 70.042. The mean score on MMPI Scale 2 (D) for those giving none of these responses was 67.351. This result is shown in Table 10. The difference between the means was not significant, t (147) = 1.143, $p < .08$. The null hypothesis could not be rejected. This part of the subhypothesis was not supported.

The mean score on MMPI Scale 7 (Pt) for those individuals giving at least one T, V, Y, TF, VF, or YF Rorschach response was 71.611. The mean score on MMPI Scale 7 (Pt) for those giving none of these responses was 66.818. This result is shown in Table 10. The difference between the means was not significant, although, as in the previous case, the difference was in the expected direction, t (147) = 2.313, $p < .015$. The null hypothesis could not be rejected. This part of the subhypothesis was not supported.

Subhypothesis 6. The obtained correlation between the proportion of Rorschach shading responses determined primarily by form (FT, FV, and FY), using the normalized T-scores for this combined group of responses, and the

WAIS FSIQ, was .3034. This result is shown in Table 11. This was significant, t (147) = 3.505, $p < .001$. The null hypothesis was rejected. The subhypothesis was supported.

Subhypothesis 7. The obtained correlation between the proportion of Rorschach shading responses determined primarily by form (FT, FV, and FY), using the normalized T-scores for this combined group of responses, and the Rorschach secondary space score, using the normalized T-scores for this response category, was .2546. This result is shown in Table 11. This was significant, t (147) = 2.985, $p < .001$. The null hypothesis was rejected. The subhypothesis was supported.

Subhypothesis 8. For the males in the sample, the obtained correlation between the proportion of Rorschach shading responses determined primarily by form (FT, FV, and FY), using the normalized T-scores for this combined group of responses, and MMPI Scale 5 (Mf) scores, was -.1546. This result is shown in Table 11. This was not significant, t (83) = -1.426, $p < .925$. The null hypothesis could not be rejected. The subhypothesis was not supported.

Hypothesis 3. The obtained correlation between the proportion of Rorschach FT, FV, and FY responses, using the normalized T-scores for this combined group of

Table 11

Correlations of Rorschach Fsh[a] with other variables

WAIS FSIQ All Ss (n = 149)	Rorschach SS All Ss (n = 149)	Rorschach Sh[b] All Ss (n = 149)	MMPI Scl. 5 (Mf) Males (n = 85)
.3034*	.2546*	.0193	-.1546

[a] Fsh = FT + FV + FY

[b] Sh = T + V + Y + TF + VF + YF

*p < .001

responses, and the proportion of Rorschach T, V, and Y responses, using the normalized T-scores for this combined group of responses, was .1093. This result is shown in Table 11. This was not significant, t (147) = 1.317, $p < .092$. The null statistical hypothesis could not be rejected. The research hypothesis of no correlation was supported.

Hypothesis 4. Canonical correlations between the IQ and MMPI scores (excluding MMPI Scale 5, which is not comparable in males and females), as the first set, and the Rorschach response scores, as the second set, were computer calculated. Chi-square and degrees of freedom calculations were also computer obtained. These results are shown in Table 12: Ten correlations were calculated. The correlation for the first pair of canonical variates was .578. This was not significant, χ^2 (170) = 191.91, p = .12. Consequently, as will be seen from Table 12, the remaining canonical correlations were also non-significant. The null hypothesis could not be rejected. The research hypothesis was not supported.

Hypotheses 5 and 6. Factor analysis was by the principal components method, with unities in the main diagonal of the correlation matrix. Initial factor extraction resulted in 9 factors with an eigenvalue of 1.0 or greater.

Table 12

Canonical Correlations and Significance

Number	Canonical Correlation	Chi-square	D.F.	Significance
1	.5780	191.91	170	.120
2	.4932	137.44	144	.638
3	.4283	100.08	120	.907
4	.3976	72.93	98	.973
5	.3265	49.87	78	.995
6	.3006	34.77	60	.996
7	.2840	22.08	44	.998
8	.1995	10.81	30	.999
9	.1700	5.37	18	.998
10	.1003	1.44	8	.994

These 9 factors, which were retained for rotation and further analysis, are shown in Table 13.

In order to simplify the clustering of variables, and to make the clusterings as meaningful as possible, these factors were rotated by the Varimax method, resulting in orthogonal (uncorrelated) factors. However, the rotation, although producing a lower factorial complexity for nine of the variables, increased the complexity of five others. Moreover, for one of the variables under study, Sh, the highest loading in the rotated matrix was negative. Therefore, the unrotated factors were retained for analysis.

In accord with Nunnaly's (1970) criterion of considering only variables of greater than +.30 or -.30 loadings as being significant, a listing of these variables for each factor was compiled. This listing is shown in Table 14.

As indicated in this table of significant factor loadings, the variable Sh, consisting of combined Rorschach T, V, Y, TF, VF, and YF scores, loaded positively on Factors 2 and 6, and negatively on Factor 7. Factor 2 contained a loading of .19 of MMPI Scale 2 (D), and of .06 of Scale 7 (Pt). Neither of these was considered significant. Therefore, Hypothesis 5 could not be considered supported. This will be discussed in the next chapter.

Table 13

Unrotated Factor Matrix

Variables	Factors F. 1	F. 2	F. 3	F. 4	F. 5
WAIS FSIQ	-.07	.39	.33	-.10	.07
MMPI 1 (Hs)	.70	.09	.08	.11	-.31
MMPI 2 (D)	.76	.19	.05	-.43	.02
MMPI 3 (Hy)	.74	.09	.02	.17	-.34
MMPI 4 (Pd)	.70	-.16	.01	.25	-.25
MMPI 6 (Pa)	.73	-.12	.05	.12	-.11
MMPI 7 (Pt)	.87	.06	.03	-.19	.18
MMPI 8 (Sc)	.86	-.05	.03	.02	.15
MMPI 9 (Ma)	.21	-.27	-.04	.71	-.04
MMPI 0 (Si)	.40	.02	.00	-.62	.41
R	.08	-.08	.14	.33	.08
W	.03	.80	-.25	.02	-.09
D	.04	-.72	.22	.00	.13
Dd	.04	-.02	.41	.20	.22
PS	.22	-.21	.10	.11	.49
SS	-.08	.42	.02	.21	.37
M	.03	-.03	.67	-.01	.02
FM	-.07	.12	.68	-.22	-.26
m	-.04	.29	.36	.27	.15
Co	.01	.55	-.29	.07	-.12
Acco	-.19	.19	.01	.24	-.15
Sh	.19	.45	-.17	.24	-.07
Fsh	-.02	.51	.35	.02	.33
Egc	-.18	-.34	.60	.02	-.24
FD	-.06	.12	.34	-.05	-.15
F	.06	-.61	-.43	.03	.34
Ct	.14	.28	.14	.39	.59
Eigenvalue	4.53	3.19	2.40	1.83	1.75
Pct. of Var.	16.8	11.8	8.9	6.8	6.5
Cum. Pct.	16.8	28.6	37.5	44.3	50.8

Note: Sh = T + V + Y + TF + VF + YF

Fsh = FT + FV + FY

Table 13 (continued)

Unrotated Factor Matrix

Variables	Factors F. 6	F. 7	F. 8	F. 9	h^2
WAIS FSIQ	-.44	.33	.16	.23	.669
MMPI 1 (Hs)	.01	.13	-.22	-.16	.700
MMPI 2 (D)	.14	.04	.00	-.04	.824
MMPI 3 (Hy)	-.02	.18	-.19	-.08	.778
MMPI 4 (Pd)	-.03	-.05	.15	.03	.659
MMPI 6 (Pa)	-.19	-.04	-.01	.16	.644
MMPI 7 (Pt)	.06	.04	.05	.00	.831
MMPI 8 (Sc)	-.05	-.12	.19	-.01	.810
MMPI 9 (Ma)	-.12	-.01	.24	-.05	.707
MMPI 0 (Si)	.11	-.14	.04	.08	.750
R	-.33	.02	-.10	.34	.383
W	-.16	.18	.10	.03	.780
D	.28	-.03	.14	.17	.710
Dd	-.14	-.41	-.40	-.37	.741
PS	-.01	.35	-.50	.09	.737
SS	-.26	-.11	.23	-.40	.656
M	-.01	-.05	.20	.33	.608
FM	-.04	-.15	-.16	-.13	.662
m	.45	.28	-.05	.03	.588
Co	.15	-.21	-.05	.34	.597
Acco	.31	-.04	-.33	.20	.397
Sh	.41	-.33	.15	-.05	.627
Fsh	-.13	-.13	.00	.00	.522
Egc	.06	-.16	.23	.00	.658
FD	.27	.53	.22	-.35	.681
F	-.03	.14	.09	-.13	.726
Ct	.28	.04	.12	.08	.717
Eigenvalue	1.25	1.14	1.05	1.01	
Pct. of Var.	4.6	4.2	3.9	3.7	
Cum. Pct.	55.4	59.6	63.5	67.3	

Note: Sh = T + V + Y + TF + VF + FY
Fsh = FT + FV + FY

Table 14

Variable Loadings Defining Factors

F. 1		F. 2		F. 3	
MMPI 7 (Pt)	.87	W	.80	FM	.68
MMPI 8 (Sc)	.86	Co	.55	M	.67
MMPI 2 (D)	.76	Fsh	.51	Egc	.60
MMPI 3 (Hy)	.74	Sh	.45	Dd	.41
MMPI 6 (Pa)	.73	SS	.42	m	.36
MMPI 4 (Pd)	.70	WAIS FSIQ	.39	Fsh	.35
MMPI 1 (Hs)	.70	D	-.72	FD	.34
MMPI 0 (Si)	.40	F	-.61	WAIS FSIQ	.33
		Egc	-.34	F	-.43

Table 14 (continued)

Variable Loadings Defining Factors

F. 4		F. 5		F. 6	
MMPI 9 (Ma)	.71	Ct	.59	m	.45
Ct	.39	R	.33	Sh	.41
R	.33	MMPI 0 (Si)	.41	Acco	.31
MMPI 0 (Si)	-.62	SS	.37	WAIS FSIQ	-.44
MMPI 2 (D)	-.43	F	.34	R	-.33
		Fsh	.33		
		MMPI 3 (Hy)	-.34		
		MMPI 1 (Hs)	-.31		

Table 14 (continued)

Variable Loadings Defining Factors

F. 7		F. 8		F. 9	
FD	.53	PS	-.50	Co	.34
PS	.35	Dd	-.40	R	.34
WAIS FSIQ	.33	Acco	-.33	M	.33
Dd	-.33			SS	-.40
Sh	-.41			Dd	-.37
				FD	-.35

Table 14 shows that variable Fsh, consisting of combined Rorschach FT, FV, and FY scores, loaded significantly on Factor 2, which also contains significant loadings of WAIS FSIQ and of Rorschach SS. Hypothesis 6 was supported by this factor.

The variable Fsh also loaded significantly on Factor 3, which contained a significant loading of WAIS FSIQ, although Rorschach SS did not load on this factor. Therefor, Hypothesis 6 was considered partly supported by this factor.

Finally, Fsh also loaded significantly on Factor 5, which contained a significant loading of Rorschach SS, although it had no significant loading on WAIS FSIQ. Hypothesis 6, therefore, was also considered as partly supported by this factor.

The interpretation of these factors, and their meaning for the hypotheses, will be discussed in the next chapter, which presents a summary and clarification of the results, discusses the relationship of this study to previous research, considers the limitations of this study, and offers some theoretical and practical implications, as well as some suggestions for further research.

CHAPTER IV

DISCUSSION AND CONCLUSIONS

This chapter will look further into the meaning of the results obtained through statistical analysis of the data, and will summarize this discussion. The relationship of the present study to previous research will be discussed. Some limitations on the study will also be discussed. The theoretical and practical implications of the findings will be investigated, and some suggestions will be made for further research.

Discussion of Results

The theoretical rationale for the shading responses, presented in Chapter I, resulted in two proposals:

1. That the shading responses determined exclusively or primarily by shading, are the result of depression and anxiety, through the mediation of an intervening variable, hypothetically construed as "perceptual apathy."

2. That the shading responses determined primarily by form are the result of intelligence, through the mediation of an intervening variable, hypothetically construed as "perceptual sensitivity."

These two proposals resulted in six hypotheses, the first two of which contained several subhypotheses. All

of these were tested. The results of the tests of each of these hypotheses and subhypotheses will be examined, and the results evaluated.

Hypothesis 1

The first subhypothesis, that the Rorschach responses determined exclusively by shading would be correlated with the MMPI D Scale, and the second, that these responses would be correlated with the MMPI Pt Scale, were not supported by the statistical tests. The correlation was not significant, i.e., it was not great enough to reject the null hypothesis that in the population represented by the subject pool, there is no correlation. The question arises, why this result was obtained.

The most obvious answer to the question, certainly, is that these two variables are, in fact, uncorrelated in the population represented by the subject pool. From this it can be generalized that these two variables are uncorrelated in the population at large, of which the subject pool used in the study could be considered a random sample.

Before making any such generalization, however, other aspects of the study need to be examined. Among the factors affecting the size of a correlation coefficient computed for a sample, are (a) sampling procedures, (b) heterogeneity, or variability of the variables being

correlated, within the sample, and certain others. In this study, the available clinical records were accepted as a probably random sample of the clinical outpatient population, as is customary in such research. However, the results of the analysis of the data call this assumption into question.

Exner (1974, 1978) has collected a large pool of several hundred protocols for use in the development and refinement of his Comprehensive System. He reported the number of T, TF, and FT responses in a randomly selected group of 250 records from his total pool of 835 protocols (Exner, 1974, p. 91). From his figures, the mean score per record of each of these variables was calculated, and compared with the mean score for the 149 subjects in this study. These figures are presented in Table 15. As is seen from the table, the mean number of T responses per protocol for Exner's sample was more than three and a half times greater than the mean for the subjects in this study. The reason for this difference can only be a matter of speculation. Although Exner did not report similar figures for the V and Y responses, the same thing is probably true of them, as well.

This means that no generalization beyond the population represented by the subject pool used in this study is warranted.

Table 15

Comparison of Means of Three Shading Variables

Variable	Exner's Sample (n = 250)	This Study (n = 149)
T	.048	.013
TF	.356	.309
FT	1.096	1.436

Note: Figures for Exner's sample compiled from Exner, J. E. The Rorschach: A comprehensive system. New York: Wiley, 1974, p. 91.

Of the 149 protocols in the present study, only 12 contained one or more responses determined exclusively by shading. The large number of 0 scores reduced the variability in this distribution of scores to a minimum. It is this extremely low variability which possibly accounts for the non-significant correlation found between the shading variables and the MMPI Scales 2 (D) and 7 (Pt). This does not mean, of course, that more variability would have produced significant correlations; it might or might not have done so. It does mean, however, especially on comparison with Exner's figures, that generalization beyond the population represented by the subject pool is not warranted.

The same consideration holds true for subhypothesis 3. In comparing the correlations with the MMPI scales of the pure shading and shading-form responses, this same lack of sufficient variability insured non-significant sample correlations. Therefore, even the direction of difference between them is meaningless, since the probability is that this, too, is due to sampling fluctuation. And as in the previous case, no generalizations can be made beyond the population represented by the subject pool.

A similar problem occurs with subhypothesis 4. The significance test for the difference between the mean scores on the MMPI measures of depression and anxiety for those giving more pure shading responses than shading-form

responses, and for those giving more shading-form than pure shading responses, indicated that the difference, although in the expected direction, was non-significant. But there were only 2 subjects who gave more pure shading than shading-form responses. This means that the difference would have to be 24 points on MMPI Scale 2 (D), and 22 points on Scale 7 (Pt), to show a significant difference--approximately two standard deviations on each MMPI scale. It seems clear that here, too, no generalizations can be made beyond the subject pool used, and the population it represents.

The test of subhypothesis 5 also yielded non-significant, though near-significant results. The difference between the means on the depression and anxiety measures of those giving at least one shading or shading-form response and those giving none of these, was found to be non-significant, though in the expected direction. Since the difference was not large, and since the significance level on the anxiety measure approached the .01 level ($p<.015$), further testing with a larger subject pool seems indicated.

To summarize, Hypothesis 1, that the pure shading responses would correlate with MMPI measures of depression and anxiety, and that shading-form responses would also correlate with these measures, though at a lesser level, was not supported. But there is evidence that no generalizations can be made from this result. Further testing, with a larger subject pool, is indicated.

Hypothesis 2

The second hypothesis, that individuals who score higher on measures of intelligence would give relatively more form-shading responses, was supported, though not completely. The correlation between the form-shading responses and the full scale WAIS IQ, though not large, was highly significant, $p < .001$. Likewise, the correlation between the form-shading responses and the secondary space responses, used as another measure of intelligence, though again not large, was highly significant, $p < .001$. Contrary to expectations, the form-shading responses were not significantly correlated with MMPI Scale 5 (Mf) for the males in the subject pool.

The conclusion drawn from these results is that the form-shading responses, as hypothesized, do, indeed reflect intelligence. The further conclusion is that the hypothesized intervening hypothetical construct of "perceptual sensitivity," has some probability of underlying the behavioral phenomenon that issues in the form-shading response. However, if this hypothetical construct does, in fact, mediate between intelligence and the shading-form responses, it is seen to do so, at least on the evidence of these results, only between the kinds of intelligence measured by the WAIS FSIQ and reflected in the Rorschach secondary space responses, and the form-shading responses;

it does not, on the basis of these results, mediate between whatever is measured by the MMPI Mf scale and the form-shading responses. Moreover, since the correlation between the form-shading responses and the FSIQ scores (r = .3034) and that between these responses and the secondary space responses (r = .2564), accounted for only about 16% of the variance in the responses, these latter must also reflect other factors. This will be discussed further in considering the results of factor analysis.

These findings call into question the traditional interpretation of form-shading responses primarily as shading responses, with the form component seen as indicating "control" over the process indicated by the shading. All the systematizers have considered form-shading responses in this fashion, whether texture, vista, or diffuse shading. The present findings indicate that these responses might well be better interpreted primarily in terms of their form component, with the shading taken as a nuance, possibly indicating the presence of the hypothesized "perceptual sensitivity," but certainly indicating intelligence. Whether Schachtel's (1966) further correlate of interpersonal sensitivity (pp. 251-252) can be inferred cannot be decided on the basis of these results. It may also be that the various kinds of shading (texture, vista, diffuse shading) used as nuances are indicative of further and finer differentiations in intelligence, or in the

hypothesized "perceptual sensitivity." This cannot be known from the present results. Further investigation, with a larger subject pool, might examine this question.

Hypothesis 3

The third hypothesis, that form-shading responses would be uncorrelated with shading and shading-form responses, was supported. In a sense, the support of this hypothesis is indirect, since the most that can be said with certainty, is that there was insufficient evidence to reject the null hypothesis, or, stated another way, there was insufficient evidence to establish a relationship between form-shading and other shading responses. The statistically reliable way to confirm the hypothesis of no relationship is through replication. Few if any of the previous studies, however, have investigated this particular relationship. Further confirmation, therefore, will have to await further investigation.

This lack of relationship is of considerable importance. Since the shading responses determined primarily by form are not correlated with those determined primarily by shading, there seems to be no justification for regarding them as measuring the same thing. The prevailing trend, however, is to regard texture responses as indicating "the emotional impact of the need for affective contact" (Exner, 1978, p. 111), which is more or less

controlled when the form component is primary; to regard the vista responses as indicative of self-examination, usually painful, but which can be productive if form is primary; and to regard the diffuse shading responses as indicating painful affective experiences of helplessness or withdrawal, with or without anxiety, but which is cognitively controlled where form is the primary determinant (Exner, 1974, pp. 284-290).

But the lack of correlation between the form-primary and the shading-primary shading responses, together with the correlation between form-shading and measures of intelligence, suggest that the interpretation of these form-primary shading responses, whether FT, FV, or FY, should be primarily in terms of intelligence, and perhaps of the hypothesized construct of "perceptual sensitivity." In any case, that the FT, FV, and FY responses indicate primarily the ability to perceive form, and to do so in a manner that is sensitive to other nuances, seems clear. Any other hypothesis as to their meaning should proceed from this.

Hypothesis 4

The fourth hypothesis, that the set of FSIQ scores on the WAIS and the MMPI clincial scores (excluding MF), and the set of Rorschach scores, would be canonically

correlated, was not supported.

This hypothesis contains the assumption that a substantial amount of the variance of the variables in each set, reflecting a substantial amount of measurement of personality factors or dimensions, would be common to both sets. The failure to find a significant correlation between the two sets of scores indicates that the amount of common variance is not substantial, at least not substantial enough for a linear combination of variables from one set to predict the variance of a linear combination from the other set.

From this, it is concluded that what clinicians have always thought, is correct: that one psychological test is not sufficient to measure all pertinent personality variables, and diagnosis should therefore not be based on a single test. This is hardly a new discovery. What is surprising is that the dimensions measured by the Rorschach responses and the other two tests are so varied that they have so little overlap. This seems to confirm the judgment of the clinicians surveyed by Wade, Baker, Morton, and Baker (1978), who included the Rorschach, WAIS, and MMPI among the four tests most frequently recommended to be taught to psychology students.

Hypothesis 5

The fifth hypothesis, that factor analysis would prolong a factor partially defined by Rorschach shading and shading-form, by MMPI Scale 2 (D), and MMPI Scale 7 (Pt), was not supported. The results of testing the subhypotheses of Hypothesis 1 are pertinent here. The hypothesis that these variables would define an analytic factor assumed that the three would be intercorrelated. Since they were not, it was not surprising that the hypothesized factor did not emerge.

However, an examination of those factors on which the shading and shading-form responses did load, is revealing. There were Factors 2, 6, and 7.

Factor 6 will be examined first. This factor has positive loadings of m (inanimate movement) and Acco (achromatic color), in addition to Sh (shading and shading-form), and negative loadings of WAIS FSIQ and R (total number of responses). Exner (1974) sees m (inanimate movement responses) as reflecting "the tension and discomfort experienced by the inability to attain a stabilizing relationship with the environment" (p. 266). He interprets achromatic color as an indicator of constrained affect, resulting in pain or tension, or both, which can upset the subject's cognitive functioning. The negative loadings of IQ and R obviously indicate low level

intellectual functioning (either for lack of endowment or because of interference by the constrained affect indicated by Acco), and restricted responsiveness to external stimuli.

This factor, then, would reflect a general lowering of cognitive or intellectual functioning, interior tension and pain, and lowered ability to respond to or interact with the environment, originating in frustration in interpersonal activities. The most concise label that could be given this factor would be "frustration-based cognitive and interactive impairment." Since Sh loads positively on this factor, the implication is that this cognitive and interactive impairment is at work in producing the responses determined primarily or exclusively by shading.

Factor 7, in addition to the negative loading of Sh (shading and shading form), has positive loadings of FD (form-dimensionality), PS (primary space), and IQ, and a negative loading of Dd (unusual detail). The form-dimensional responses were first identified by Exner (1974). His interpretation of these responses, based on his research, is that they are an indication of self-awareness and introspection. Primary space responses were interpreted by Fonda (1960) as indicative of autonomy, or striving for it. This interpretation has been confirmed by Exner (1974), with the added nuance of some negativism and possibly anger. Unusual detail responses are indicative of

just what the name implies: attention to unusually noticed details of the environment. High scores are usually interpreted as indicating a kind of intellectualized withdrawal from the more obvious aspects of the environment. Low scores on this variable, or a negative factor loading, would indicate a tendency to perceive the more obvious features of the environment.

This factor, then, would characterize reasonably intelligent individuals who strive actively to maintain their autonomy, who are rather like the "peasant of the Danube," who stands firm with both feet solidly on the ground, conforming his perceptions to the obvious reality, inattentive to "unusual detail," and who are well aware of themselves. The most concise label that could be put on this factor would be "aggressive and reality-based self-awareness and autonomy." Since Sh loads negatively on this factor, the implication is that these aggressive, self-aware, independent individuals, much in touch with the obvious features of the environment, are the ones who do not give Sh responses.

Since Sh loads positively on Factor 6 and negatively on Factor 7, the Sh responder can be characterized as one who is unable to achieve a satisfactory relationship to the external world, who feels some tension and discomfort about this, who is not inclined to externalize feelings, who is not particularly self-aware, nor introspective,

cannot "stand on his own feet," is unduly caught up in or confused by the less important aspects of the environment, who is not aggressive, who does not respond well to external stimuli.

This description, synthesized from the meaning of the variables loading on these factors, is taken to indicate that the hypothetical state of "perceptual apathy" proposed as the intervening variable which mediates between the personality factors seen as the underlying cause of the shading response (the independent variable) and the shading response (the dependent variable), has "some probability of being in correspondence with the actual events" (MacCorquodale & Meehl, 1948, p. 105).

The loading of a variable on an extracted factor obtained through factor analysis indicates a type of correlation. The purpose of factor analysis is to attempt to account for the variance in the variables involved through combined groups of variables, rather than through separate correlations with each of the other variables. These groups of variables, with the correlation of each variable with the group, constitute the factors. No one factor, when more than one is extracted, accounts for all the variance in one particular variable. The loading of the variable, like the ordinary correlation coefficient, is the square root of the variance of that variable accounted for by the factor on which it loads. Therefore, squaring the

loading of a variable on a factor gives the percentage of the total variance of that variable accounted for by that factor.

The Sh loading on Factor 6 is .41, and on Factor 7, -.41. Squaring these coefficients and adding them indicate that these two factors together account for approximately 34% of the variance of the Sh responses.

Sh also had a positive loading of .45 on Factor 2, accounting for approximately 21% of its variance. This factor will be discussed below, in connection with hypothesis 6, and will be seen to be compatible with the hypothesized state of "perceptual sensitivity." The implication is that in some cases, shading and shading-form responses reflect, not the failure or inability to proceed to the form-determined Gestalt, but rather the ability to focus attention deliberately on the nuances, the shading qualities of the blot, while responding to the form of the stimulus only secondarily, in the shading-form responses, or not at all, in the pure shading responses.

The conclusion from this consideration of the extracted factors is that the shading responses determined exclusively or primarily by shading are more likely to indicate a state which is characterized by failure to carry the perceptual process to conclusion, and which is compatible with the hypothesized state of "perceptual apathy."

But they may also represent an ability to bypass deliberately, either partially or altogether, the more obvious form qualities in the process of associating to the perceived Gestalt, associating instead to the nuances of the stimulus. Which of these two meanings is to be attached to the shading and shading-form responses will be known from the overall quality of the protocol.

Hypothesis 6

The sixth hypothesis, that factor analysis would produce a factor partially defined by the WAIS FSIQ, Rorschach secondary space responses, and Rorschach form-shading responses, was supported. Fsh (form-shading) loaded on Factor 2, which also had significant loadings of the other two variables. In addition, Fsh loaded significantly on Factors 3 and 5. Each of these will be examined separately.

Factor 2 had positive loadings of W (whole responses), Co (color), Sh (shading and shading-form), SS (secondary space responses), and IQ, in addition to Fsh. It had negative loadings of D (common details), F (form), and Egc (egocentricity).

All the systematizers have agreed with Rorschach (1942) that the whole response is connected with cognitive operations, having to do with the ability to synthesize,

or organize the various components of the environment into a meaningful whole. Exner (1974) has confirmed this, establishing rather definitively, however, that this is true mainly of what Rorschach referred to as the well organized whole, or W+ response. Color responses, following Rorschach's (1942) hypothesis, are taken to indicate ability to respond with external expressions to affect provoking stimuli. Secondary space responses have already been identified as indicators of intelligence. Vincent (1973) found that they correlated with the organization score (Beck, 1961), and interpreted them as indicating individuals who are "alert and observant and . . . able to exercise some creativity in integrating the visual stimulus parts into a well-organized percept" (p. 15). Common detail responses, which have not been extensively researched, are regarded, in agreement with Rorschach's (1942) hypothesis that they indicate an ability to perceive and respond to the more obvious features of the environment, as characteristic of subjects who are concerned with practical, concrete aspects of reality (Exner, 1974). The negative factor loading of D would indicate freedom from being bound to the more obvious concrete or practical aspects of the environment. Form responses, seen by Rorschach as an index of ability to focus attention and concentration on the stimuli in the environment, continue to

be seen similarly by other interpreters. A high score (or positive factor loading) would indicate rigidity; a low score (or negative factor loading) would indicate either emotional interference with thought processes, or simply a freedom from rigidity. Egocentricity is a scoring category devised by Exner (1974), consisting of a weighted combination of reflection and pair responses, both of which he first identified as separate scoring categories. His research into the meaning of these responses has confirmed that they are given by those individuals who manifest self-centeredness or egocentricity. The negative factor loading of Egc would indicate interpersonal concern.

This factor, then, would characterize individuals who can adopt a cognitively oriented comprehensive approach to the environment, who can respond externally to affective stimuli, who are alert and observant of nuances and can respond creatively to them, who are not bound to the obvious or immediately practical, who are more flexible than rigid in responding to the world around them, and who are more interpersonally sensitive than self-centered. This factor is considered as highly compatible with the hypothesized "perceptual sensitivity," and is the one on which Fsh loaded highest.

Fsh also loaded positively on Factor 3. This factor

also had positive loadings of FM (animal movement), M (human movement), Egc (egocentricity), Dd (unusual details), m (inanimate movement), FD (form-dimensionality), and IQ, and a negative loading of F (form).

Animal movement responses were not considered as a separate scoring category by Rorschach, and are scored only by Klopfer, Hertz, Piotrowski, and Exner. There is a body of literature concerning them; the bulk of it seems to indicate that these responses reveal a level of physical energy. Human movement responses were identified by Rorschach (1942) as a sign of internalization. A great deal of research has been done on this determinant, from which Exner (1974) has concluded that

> M has an intellectual base which includes a sort of reasoning, the components of imagination, and a form of higher level conceptualization . . . a form of defensiveness through which the world, and potential responses to it, are "sorted through." (p. 263)

It can be taken, therefore, to indicate a well organized and reality based inner experience of fantasy. Egocentricity and form were discussed above, in connection with Factor 2. Unusual detail and form-dimensional responses were discussed above in connection with Factor 7. Inanimate movement responses were discussed above in connection with Factor 6.

This factor, then, would characterize those intelligent, energetic individuals whose response to occasionally felt frustrations in interpersonal relationships and in

the face of impersonal forces, is flexible, based on self-awareness and self-concern, who consider even small details and implications in sifting through possible responses to these situations before deciding what to do. The most concise label that can be given this factor is "perceptual and behavioral organization." Since Fsh loads positively on this factor, the implication is that these form-shading responses are indicative of the ability to organize perception and behavior into meaningful patterns.

Factor 5 had positive loadings of Ct (number of content categories), R (number of responses), MMPI Scale 0 (social introversion), SS (secondary space responses), F (form), and negative loadings of MMPI Scales 3 (hysteria) and 1 (hypochondriasis). The number of content categories has been the subject of very little research. Exner (1974) seems correct in stating that the number of content categories is a rough index of cognitive flexibility. The total number of responses is probably best regarded in the context of factor analysis as simply an index of productivity, or perhaps better, of responsiveness to the stimuli. MMPI Scale 0 (Si) was developed to measure social introversion (Dahlstrom, Welsh, & Dahlstrom, 1972). The positive loading of this scale indicates a tendency towards limited interpersonal interaction, or even withdrawal from such interaction. Secondary space responses were

discussed above, in connection with Factor 2, and seen as indicators of intelligence. Form responses were discussed above, in connection with Factor 2, and seen as indicating ability to focus attention and concentration. MMPI Scale 3 (Hy) was designed to measure the clinical entity of hysteria, as it was conceptualized at that time (Dahlstrom, Welsh, & Dahlstrom, 1972). Subsequent research has generally agreed that it is an indicator of the use of the mechanism of denial as a psychological defense. The negative loading of this scale would indicate a tendency not to resort to this mechanism, but to accept both the external world and internal experiences, whether reinforcing or threatening, in realistic fashion. MMPI Scale 1 (Hs) was designed to measure the clinical entity of hypochondriasis (Dahlstrom, Welsh, & Dahlstrom, 1972). High scores on the scale reflect excessive concern about bodily Health; low scores, and the negative factor loading, would indicate satisfaction with one's body image. These low scores are typical of athletes, and young people generally (Dahlstrom, Welsh, & Dahlstrom, 1972).

This factor, then, would characterize cognitively oriented individuals who have a rich and varied store of memories of previous perceptions, and who can thus produce more numerous and more varied responses to the external world, whose ability to focus attention and concentration is notable, who are happy with themselves, unafraid to

face the unpleasant as well as the pleasant realities of life, and feel little need for social interaction. They are the "happy loners," frequently alone, but not lonely, because their interior life is rich and varied enough to be satisfying. The most concise label that could be given to this factor would be "functional autonomy" (without reference to the Allportian use of the same phrase to describe motivation). Since Fsh loaded positively on this factor, the implication is that these form-shading responses are indicators of this functional autonomy.

Fsh had a loading of .51 on Factor 2, of .35 on Factor 3, and of .33 on Factor 5. The sum of the squares of these coefficients indicates that these factors determine approximately 49% of the variance in the form-shading responses. More than half of this variance (26%) is determined by Factor 2, identified as characteristic of cognitively oriented, observant, flexible, and interpersonally sensitive individuals, and as compatibile with the hypothesized factor of "perceptual sensitivity." The rest is determined by Factors 3 and 5, identified as perceptual and behavioral organization, and functional autonomy.

The conclusion from this consideration of the extracted factors is that the shading responses determined primarily by form are mainly indicative of cognitive orientation, ability to observe carefully, cognitive and behavioral flexibility, and interpersonal sensitivity, but

may also indicate ability to organize one's perceptions and behaviors, and ability to function well independently, i.e., without requiring reinforcement from interpersonal sources.

The following section presents conclusions from the study.

Conclusions

The conclusions drawn from the findings are stated formally as follows:

1. Shading responses in which form is absent or is secondary to shading, and those in which form is primary, have different meanings and should not be interpreted as reflecting varying degrees of the same personality characteristic.

2. Shading responses in which form is absent or is secondary to shading ordinarily are indicative of frustration-based cognitive and interactive impairment, which may produce the responses by interfering with the eye movements or the attention shifts required in the perceptual process.

3. Shading responses in which form is absent or is secondary to shading are also indicative of the ability to focus attention deliberately on the nuances of the perceived stimulus, while responding to the form only secondarily, or not at all.

4. Which of these two meanings is attached to these shading and shading-form responses will be determined by examination of the entire protocol, which will reveal the pattern of responding which is more congruent with one or the other meaning.

5. Shading responses in which form is the primary determinant are indicators of intelligence, as measured by the WAIS FSIQ and indicated by the Rorschach secondary space responses.

6. Shading responses in which form is the primary determinant are also indicators of the ability to adopt a cognitively oriented approach to reality, but with notable alertness to nuances in the environment, and with flexibility in responding.

7. Shading responses in which form is the primary determinant are also indicators of perceptual and behavioral organization, identified as a factor characteristic of intelligent, energetic individuals, whose response to frustration is flexible, based on self-awareness and self-concern, who consider even small details and implications in choosing among the responses available.

8. Shading responses in which form is the primary determinant are also indicators of functional autonomy, identified as a factor characterized by a rich store of available memory, greater than usual response productivity, attention focusing and concentration abilities,

self-satisfaction, acceptance of reality and independence.

9. The hypothetical construct of "perceptual apathy" postulated as an intervening variable mediating between anxiety and depression seen as causative and the shading and shading-form responses seen as resulting, has some probability of corresponding with the actual events taking place in the production of these responses. There is no evidence, from the results of the study, that it actually does mediate the production of these responses by anxiety and depression.

10. The hypothetical construct of "perceptual sensitivity" postulated as an intervening variable mediating between intelligence seen as causative and the form-shading responses seen as resulting, has some probability of corresponding with the actual events taking place in the production of these responses. It also has some probability of mediating between intelligence and the production of these responses.

Summary

Chapter I, after reviewing the literature, concluded with the statement of the research problem as fourfold:

1. To postulate hypothetical constructs which act as intervening variables between observable personality factors as independent variables, and shading responses as

dependent variables, and to establish that these hypothetical constructs are credible, i.e., that they have some probability of being in correspondence with the actual events underlying the behavioral phenomena.

2. To determine whether the shading responses determined primarily by shading reflect an interference with the perceptual process by anxiety and depression, which would enter into the hypothesized construct of "perceptual apathy."

3. To determine whether the shading responses determined primarily by form reflect intelligence, which would enter into the hypothesized construct of "perceptual sensitivity."

4. To identify the analytic factors defined by the shading responses to the Rorschach cards in conjunction with other Rorschach scores and scores from the WAIS and MMPI, and to determine the relationships among these defining variables.

The first problem was attacked by testing the relationship of the hypothesized independent variables to the dependent variables, and through factor analysis.

For the first hypothesized construct, "perceptual apathy," there was evidence from the factor analysis that this construct, as defined, does correspond fairly closely with the actual events involved in the production of the

shading and shading-form responses. The correlational study, however, failed to reveal any connection with anxiety and depression, and there was therefore no evidence that this construct mediates between these two and the shading responses.

For the second hypothesized construct, "perceptual sensitivity," there was evidence from the factor analysis that this construct, as defined, does correspond fairly closely with the actual events involved in the production of the form-shading responses. Since the correlational analysis bore out the relationship of intelligence measures to the form-shading responses, there was evidence for the possibility that this construct does mediate between intelligence and the production of form-shading responses.

The second problem was attacked by correlation analysis and factor analysis. The correlation analysis did not establish any relationship between anxiety and depression and the shading responses. The factor analysis indicated that these responses have a likelihood of being a result of cognitive and interactive impairment, which implies interference in the perceptual process.

The third problem was attacked by correlation analysis and factor analysis. The correlation analysis indicated that the shading responses determined primarily by

form do reflect intelligence of the kind measured by the WAIS FSIQ, but not that measured by MMPI Scale 5 (Mf) in males. The factor analysis indicated that these responses are the result of careful and nuanced observation, and therefore, that the hypothesized construct of "perceptual sensitivity," as defined does correspond with the actual events underlying the production of these responses, and that it enjoys some probability of mediating between intelligence and the production of these responses.

The fourth problem was attacked by factor analysis. The analysis indicated that shading responses determined primarily by shading are related positively to two factors, identified as frustration-based cognitive and interactive impairment, and as reflecting the perceptual sensitivity postulated as the intervening entity, and negatively to one factor, identified as aggressive and reality based self-awareness and autonomy. The analysis indicated that the shading responses determined primarily by form are related to three factors, identified as reflecting perceptual sensitivity, perceptual and behavioral organization, and functional autonomy.

This section has discussed the results of the research procedures used, presented the conclusions drawn from these results, and summaried the research. The next section will discuss the relationship of this study to previous efforts.

Relationship of Present Research to Previous Work

The relationship of the present research to previous work in this area will be considered under the three aspects of theoretical bases, methodology, and research findings. These will be examined separately.

Theoretical Bases

In attempting to discover the relationship of the shading responses to personality variables, this study presented a theoretical base for understanding these responses, based on empirical research findings in the field of visual perception. As far as can be determined, there is no precedent for this. Frank's (1978) complaint about the lack of anything more than conjecture or intuitive rationale "to explain why an individual's response to shading should be interpreted in terms of the way one deals with anxiety" (p. 536) has already been noted, in Chapter I. As far as can be determined from published journal articles and abstracts of theses and dissertations, this study is the first attempt to meet Frank's challenge by providing a scientifically based rationale for the alleged connection between shading responses and anxiety.

While the proposed connection between shading responses and interference-producing anxiety and depression

could not be directly established from the data, there was indirect evidence, through factor analysis, that the shading responses reflect the kind of interference expected from anxiety and depression. The results of the factor analysis indicate that the shading responses in which form is absent, or is only secondary, are related to a factor identified as frustration-based cognitive and interactive impairment, and negatively related to a factor identified as aggressive and reality-based self-awareness and autonomy. Although the results of this study cannot be generalized beyond the population represented by the subject pool used, the door is opened, in any case, to further investigation, with a stated scientific rationale, based on what is known of the nature of perception as a starting point. In this sense, the present study is a continuation of previous research into the Rorschach generally, and the shading responses in particular, but also represents a step in a new direction.

Similarly, by working from a scientific rather than intuitive rationale, this study has presented a new approach to understanding the shading responses in which form is the primary determinant. This approach, while utilizing both the intuitive interpretations of the systematizers and the empirically based findings of the researchers, has opened a new avenue of interpretation based on scientific rationale.

Methodology

As noted in Chapter II, Rorschach research has long been plagued with the problem of "controlling" for the varying number of total responses per subject, in statistical analysis as well as in clinical interpretation. The literature does not provide any really satisfactory solution to the problem, as it applies to statistical analysis.

This study has demonstrated a new approach to this problem, the use of normalized T-scores for the Rorschach variables within number-of-total-response categories of protocols. This solution achieves normality of distribution for the scores, making possible more accurate correlation analysis and analysis of variance; it solves the problem of different meanings of the same score on a response variable in protocols of differing length; and it avoids the problems of indexing, making it unnecessary to avoid correlational techniques, and thus facilitating other multivariate approaches, such as factor analysis and canonical correlation.

Admittedly, this technique, as used in this study, is not perfect. However, there are further refinements possible, which will be discussed in the section on suggestions for further research. It is felt that the demonstration of the new methodological technique is, even without the possible further refinements, a step forward.

Research Findings

Previous research into the meaning of the various shading responses has been mainly directed at the question "Do these responses reflect anxiety or don't they?", and the answer from the published research, as Auerbach and Spielberger (1972) and Frank (1978) have noted, has been that "sometimes they do, and sometimes they don't." This study indicates that these responses may reflect cognitive and interactive impairment, which may or may not be connected with anxiety; or that they may in some cases reflect a kind of creative imagination, which is not connected with anxiety; or that they may, in the case of the form-dominant responses, reflect enhanced perceptual and behavioral organization, or functional autonomy, which may not be connected with anxiety. This finding offers some explanation for the sometimes contradictory previous findings, and may provide at least the beginnings of the answer to this fifty-year old but still unanswered question.

The findings of the study in this regard recall Wittenborn's (1950) early factor analytic study, which led him to observe that his findings

> suggest that the behavioral or personality significance traditionally ascribed to many of the specific Rorschach scoring categories may be incorrect in its emphasis even if valid to a degree. (p. 265)

The findings of this study offer an alternative to the

significance traditionally ascribed to the form-shading responses.

Finally, this study has attempted to follow the direction indicated by Exner's (1974, 1978) work. His Comprehensive System is the first Rorschach system based on extensive evaluation of empirical findings, and on substantial research designed specifically to test the hypotheses of the system itself. At the same time, it incorporates a certain amount of the theoretical base for the interpretations offered. His system stands alone as a Rorschach system geared not only towards clinical interpretation, which is its primary thrust, but also towards the generation of hypotheses that can be empirically tested. This study has tried to follow the direction he has pointed out.

The study, then, grows out of previous research, moves in a new direction with regard to shading responses, and attempts to do so on an empirical basis.

The study also has some limitations. These will be discussed in the following section.

Limitations of the Study

This study is felt to have made some contributions to the knowledge and understanding of the shading responses, and to the methodology for further study of Rorschach variables through statistical analysis. There are, however,

some shortcomings. These are discussed below.

The method of adjusting scores for R, through the use of normalized scores, was discussed in Chapter II. The demonstration of this technique is considered to be a contribution, but the small size of the subject pool imposed a limitation on its use.

This was the necessity of grouping the protocols. There were protocols of 40 different totals on R. Ideally, a distribution of normalized T-scores would be made for the protocols for each R score. But this would require, as an absolute minimum, three protocols for each R score. In the subject pool, there were 16 R scores for which there were only one or two protocols, and seven for which there were only three. Therefore, in order to obtain sufficient variability in the normalized scores, the protocols were grouped. This resulted, undoubtedly, in loss of information concerning the true relationship of the other variables to R. But it was the best solution possible, given the limited size of the subject pool. A better solution will be considered when discussing further research.

Three further shortcomings were due to the limited heterogeneity of the scores on pure shading and shading-form scores.

One of these was that it made multiple regression

analysis impossible. Several complex relationships might have been hypothesized, which could have been tested through multiple regression analysis. The regression equation, however, because of the tendency for errors of measurement in the predictor variables to accumulate, would have had to be submitted to cross validation (McNemar, 1969, pp. 208-210). And this, in turn, would have required splitting the sample, resulting in worsening the already vitiating problem of limited variability, and assuring trivial and perhaps meaningless results. In any case, the inability to examine the possible multiple predictors of the shading responses, and to consider the shading responses themselves as one of several predictors of other variables, was a definite limitation. Suggestions concerning this will be made in the section on further research.

A second limitation due to the large number of 0 scores on the shading responses was that this made it impractical to separate the protocols into separate groupings according to the variety of shading used in the responses--texture, vista, or diffuse shading--in order to investigate the meaning of each of these separately, as refining the meaning of the shading and shading-form responses.

The third limitation, similar to the second, was that

the large number of 0 scores on the shading responses made it impractical to investigate the ways in which these three varieties of shading might differentiate the form-shading responses, which are seen as an essentially healthy sign.

These last two limitations leave the study to some extent open to Exner's (1974) criticism that considering texture, vista, and diffuse shading together is "like adding 'apples and bananas'" (p. 289).

These limitations, particularly to the extent that they are the result of the size of the subject pool, should be considered in planning future research.

In spite of these limitations, however, the study has made some real contributions to the body of Rorschach knowledge, and has some theoretical and practical implications. These will be considered in the next section.

Theoretical and Practical Implications

The results of this study indicate that an understanding of the Rorschach shading responses can be had by proceeding from an understanding of the perceptual processes which underlie these responses. They also represent the first attempt, as far as can be determined, to present a theoretical rationale for the traditional

association of shading responses with anxiety, or, for that matter, with any of the affect manifestations connected with anxiety. Since the results of this effort are, at least to some extent, positive, they raise the question whether all Rorschach scoring categories might not be approached from a perceptual viewpoint.

It has already been mentioned that Rorschach himself spoke of his technique as a test of perception. While it is true that there has been some effort at pursuing the nature of the perceptual processes involved in the test --one thinks of Bruner's (1948) early efforts to interpret the response process in terms of his theory of perceptual defense, of Baughman's (1959) investigation into the relation of the stimulus structure with response behavior, of Meili-Dworetzki's (1956) work concerning the development of the response process, and finally of Exner's (1978) inclusion of an entire chapter on the nature of the response process in a volume which is meant as a manual of interpretation--the establishment of a firm perceptual foundation for understanding the technique is only just beginning.

The theoretical implication of this study is that the shading responses offer one of the starting points for investigation of the precise perceptual process involved in the responding process, and perhaps ultimately for

construction of a true perceptual theory of the entire Rorschach technique.

There are some practical implications, as well.

1. The first implication, obviously, is that the clinician should be wary of interpreting the form-shading responses merely as indicators of "controlled" affective needs, or anxiety, or inferiority feelings or passivity, as they are interpreted in the Beck and Klopfer traditions.

2. A second implication is that in a Rorschach record not containing any pure shading or shading-form responses, the presence of form-shading might be interpreted as an essentially healthy sign, indicating perceptual accuracy, perceptual and behavioral organization, and functional autonomy. Such a hypothesis, of course, like all interpretative hypotheses in every Rorschach record, must be considered in the context of the entire protocol.

3. A final practical implication relates to Exner's (1974) remark concerning the diffuse shading responses that "there is support for both the shading-anxiety and the shading-passivity hypothesis, although the latter is more consistently supported" (p. 289). The findings in this study relating shading to lack of aggressiveness imply that Exner's interpretation is the correct one, and will likely be borne out by further research.

This chapter has presented a discussion of the results of the testing of the hypotheses, and the conclusions drawn from the study, followed by a summary of these. It has presented a discussion of the relationship of the study to previous research. Some limitations of the study were considered, and some theoretical and practical implications of the findings were presented. It will conclude with some suggestions for further research.

Suggestions for Further Research

The first suggestion for further research in this field has to do with methodological tasks. The use of normalized scores for the Rorschach variables within number-of-total-response groups of protocols was described in Chapter II. However, the limitation on this technique because of lack of sufficient numbers of protocols for each score of R made it necessary to construct normalized scores for each of several intervals of R, rather than for each value of R. This resulted in loss of information, and also probably resulted in a less heterogeneous distribution of scores.

In order to facilitate future research, it would be desirable to have a published table of the normalized T-scores, or at least of the frequencies of the Rorschach variable scores, for each value of R, based on a large and

demographically representative sample of non-patient adults. The only such sample reported in the literature is that of Exner (1978). He has already published means and standard deviations for the response categories in his various samples. Inclusion of these normalized scores, or the frequencies from which to derive them, at least for the response categories, if not for the derivations and ratios, as well, in future publications, would do much to aid future research in this field. It would enable researchers to change raw scores on the Rorschach variables into normalized T-scores based on a normal standardization sample, much in the same way that raw scores on the MMPI are converted into T-scores based on the standardization group for that instrument.

The most obvious suggestion for follow-up research to this study would clearly be a replication, but with the following modifications:

1. The sample should be large enough to allow for the construction of normalized scores, if not for each value of R, then for relatively small intervals of R, until such time as published norms, as suggested above, are available.

2. The sample should be large enough to increase substantially the power of the hypothesis tests, in order to counter the increased probability of type II error because

of the stringent alpha level required.

3. The sample should be large enough to allow for split sample cross-validation of multiple regression.

These three considerations would indicate a minimum sample size of approximately 200.

4. Assuming that the sample distributions of T, V, Y, TF, VF, YF, FT, FV, and FY have sufficient variability, i.e., do not have an excessive proportion of 0 scores, each of these categories should be treated separately. Failing this possibility, (T + TF), (V + VF), and (Y + YF) should be treated separately from each other and from FT, FV, and FY.

These alterations should make possible multiple regression analysis, a more accurate correlation matrix of all variables, and consequently a more meaningful result of factor analysis of the matrix.

Finally, an experimental design in which the saccadic eye movements leading to shading and shading-form responses could be directly measured and compared with the measurement of saccades leading to form-shading responses would be highly desirable. this would pose certain problems. One problem would be the probable necessity of having subjects make a very large number of responses to the Rorschach cards in order to obtain a sufficient number of the relatively infrequent shading responses, for analysis.

Whatever further research is conducted, the results of this study indicate that approaching the Rorschach from a perceptual position is a productive procedure. Further research using this approach will do much to accomplish what S. J. Beck was already encouraging as long ago as 1936, in suggesting that the approach to the technique should be that of the scientist rather than that of the artist. It will follow Frank's (1978) advice to do "more research, but not more of the same kind" (p. 537). It will help to complete the work begun by Hermann Rorschach in the manner he might have completed it himself, had he been granted a longer lifetime, the manner he indicated by labelling his technique a test of perception, and by remarking several times in his monograph that various points required further statistical analysis.

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APPENDIX A

Ages and WAIS Scores of Subjects

Subj. No.[a]	Age	WAIS FSIQ	Subj. No.	Age	WAIS FSIQ
1	27	130	26	39	134
2	28	135	27	21	115
3	22	114	28	23	126
4	27	108	29	21	117
5	28	122	30	27	113
6	25	134	31	32	105
7	30	114	32	33	120
8	24	90	33	48	108
9	28	94	34	45	101
10	28	122	35	25	110
11	29	100	36	24	102
12	42	105	37	27	98
13	21	94	38	33	114
14	31	96	39	38	99
15	21	109	40	21	115
16	33	113	41	24	122
17	21	102	42	21	108
18	34	109	43	21	102
19	40	113	44	27	108
20	28	113	45	29	100
21	22	127	46	41	116
22	33	119	47	49	117
23	28	110	48	23	109
24	43	123	49	21	130
25	41	93	50	21	121

APPENDIX A (continued)

Ages and WAIS Scores of Subjects

Subj. No.	Age	WAIS FSIQ	Subj. No.	Age	WAIS FSIQ
51	39	97	76	21	116
52	32	90	77	21	99
53	21	118	78	40	120
54	23	112	79	22	126
55	30	126	80	23	109
56	39	109	81	25	130
57	30	120	82	21	116
58	36	123	83	22	90
59	23	109	84	30	111
60	25	112	85	35	115
61	28	118	86	24	126
62	24	120	87	22	108
63	22	101	88	25	105
64	22	138	89	28	125
65	22	112	90	21	123
66	22	102	91	21	119
67	27	102	92	22	107
68	23	132	93	34	125
69	25	118	94	21	99
70	45	119	95	22	121
71	28	100	96	26	128
72	31	126	97	46	134
73	22	122	98	21	117
74	21	129	99	21	119
75	22	121	100	27	115

APPENDIX A (continued)

Ages and WAIS Scores of Subjects

Subj. No.	Age	WAIS FSIQ	Subj. No.	Age	WAIS FSIQ
101	22	98	126	41	100
102	21	112	127	22	112
103	25	122	128	25	128
104	24	105	129	24	103
105	24	113	130	50	126
106	43	103	131	21	104
107	28	114	132	25	125
108	21	102	133	40	119
109	26	107	134	22	106
110	37	99	135	23	126
111	28	114	136	23	125
112	21	113	137	27	124
113	22	136	138	40	110
114	29	89	139	21	108
115	24	114	140	24	109
116	29	120	141	21	117
117	45	123	142	27	112
118	50	117	143	33	105
119	21	123	144	24	118
120	22	120	145	32	113
121	23	104	146	21	108
122	31	121	147	24	107
123	23	116	148	26	138
124	21	129	149	28	117
125	31	127			

[a]Subjects Nos. 1-64: females; 65-149: males.

APPENDIX B

MMPI Scores of Subjects

Subj. No.[a]	Scores on MMPI Scales												
	L	F	K	1	2	3	4	5	6	7	8	9	0
1	66	53	53	44	71	45	57	53	53	65	61	40	76
2	40	58	53	46	59	61	64	34	59	66	63	60	56
3	60	62	49	46	67	42	74	45	65	58	67	63	67
4	41	76	44	68	78	70	71	41	79	81	86	55	73
5	53	58	57	50	63	63	64	47	65	60	61	63	39
6	43	50	61	48	55	56	57	41	59	61	67	60	52
7	40	50	62	54	67	56	60	53	65	58	60	45	62
8	60	68	53	60	76	66	83	43	82	79	81	75	69
9	50	64	76	50	51	57	67	68	56	55	63	73	44
10	50	68	49	64	76	68	71	57	65	73	78	53	70
11	53	64	55	58	78	68	90	45	79	74	64	55	63
12	40	62	53	66	73	75	64	53	70	74	77	58	61
13	60	73	48	56	46	54	76	43	59	51	67	93	50
14	56	53	51	64	84	80	71	30	50	65	66	73	56
15	60	76	48	52	63	70	79	61	67	68	74	70	68
16	43	70	53	60	82	73	76	37	79	86	87	50	78
17	53	43	48	42	55	47	50	51	47	60	46	50	58
18	41	60	42	37	73	42	53	22	50	60	57	45	74
19	56	64	59	64	61	63	67	30	67	69	67	60	69
20	41	50	57	50	63	49	55	39	53	66	58	48	65
21	40	73	42	52	55	52	62	43	79	76	92	65	76
22	41	55	49	60	61	72	74	43	59	61	60	55	47
23	53	62	42	42	57	47	46	45	59	51	51	65	60
24	41	50	62	46	47	49	67	43	53	46	54	53	40
25	60	48	59	48	42	57	57	43	59	50	47	60	37

APPENDIX B (continued)

MMPI Scores of Subjects

Subj. No.	Scores on MMPI Scales												
	L	F	K	1	2	3	4	5	6	7	8	9	0
26	43	55	48	50	57	54	50	30	44	50	55	58	47
27	43	55	42	48	71	57	67	55	53	63	64	53	67
28	50	62	49	66	71	72	81	57	73	60	54	55	47
29	41	64	42	48	69	54	60	49	59	63	55	55	67
30	60	64	53	48	71	56	71	34	65	68	75	58	70
31	53	55	53	46	53	64	71	49	56	48	52	50	48
32	70	53	66	54	57	54	48	70	50	63	60	40	65
33	53	64	53	85	84	107	90	41	79	79	81	68	50
34	63	73	49	52	73	63	88	53	67	84	94	53	72
35	56	46	61	46	44	57	55	49	44	51	54	63	47
36	60	60	62	70	63	68	60	45	67	71	71	63	48
37	41	44	62	52	53	54	62	32	56	66	60	50	63
38	43	86	36	52	75	52	76	55	65	69	84	63	70
39	63	66	44	60	63	59	90	45	76	56	72	73	64
40	41	58	51	46	61	54	64	45	47	60	61	63	61
41	53	66	48	68	78	80	83	47	70	79	87	45	68
42	60	62	48	64	90	66	76	26	70	78	77	68	75
43	56	48	66	56	57	56	64	59	44	63	63	63	51
44	53	66	66	70	65	68	57	45	56	66	61	58	69
45	50	53	57	70	82	82	67	41	67	74	75	65	60
46	53	68	55	64	57	64	60	55	73	61	61	65	56
47	60	53	57	50	59	61	60	47	67	58	52	48	48
48	41	60	48	62	78	66	62	43	67	78	75	53	75
49	53	81	42	66	84	73	79	47	67	88	104	60	79
50	50	55	66	48	55	66	79	24	59	60	67	70	39

APPENDIX B (continued)

MMPI Scores of Subjects

Subj. No.	Scores on MMPI Scales												
	L	F	K	1	2	3	4	5	6	7	8	9	0
51	40	58	46	64	73	72	62	57	59	79	78	65	63
52	50	58	42	68	73	73	53	53	70	61	57	40	54
53	41	79	49	64	105	77	69	43	73	94	84	45	80
54	41	50	42	35	55	43	64	47	53	51	51	75	68
55	53	53	59	54	88	52	64	30	62	71	58	45	70
56	53	55	57	52	61	64	83	47	82	60	75	60	44
57	53	60	64	58	57	66	69	51	53	56	60	58	41
58	41	53	46	64	61	63	55	41	53	63	58	58	67
59	56	55	53	54	80	61	74	43	67	78	74	60	76
60	50	48	53	48	51	56	55	39	56	56	46	50	58
61	36	66	49	70	78	86	81	43	67	89	94	73	78
62	40	55	51	54	69	59	53	24	50	74	66	55	73
63	56	50	44	46	69	45	57	55	62	68	58	48	73
64	41	73	48	48	61	56	57	49	56	76	75	60	76
65	53	62	35	72	99	78	67	73	62	93	86	55	68
66	36	64	46	49	84	45	57	67	33	69	65	45	72
67	43	48	57	44	51	55	57	65	59	60	48	55	41
68	53	86	46	100	92	87	95	71	91	87	99	78	52
69	56	64	59	75	77	69	50	78	56	89	101	63	68
70	46	76	38	70	92	69	74	65	59	97	90	58	75
71	50	55	46	47	70	53	50	53	50	54	44	45	67
72	46	48	66	52	46	56	67	57	59	62	57	63	45
73	54	46	66	57	46	69	62	78	59	56	61	55	42
74	43	79	49	65	84	69	76	86	67	87	97	83	52
75	46	70	36	54	75	58	69	65	67	69	74	55	69

APPENDIX B (continued)

MMPI Scores of Subjects

Subj. No.	Scores on MMPI Scales												
	L	F	K	1	2	3	4	5	6	7	8	9	0
76	53	50	62	54	56	51	53	57	53	56	51	55	53
77	50	64	53	52	43	55	71	47	50	56	57	78	40
78	60	78	55	75	87	78	74	69	76	93	84	73	75
79	40	62	42	44	41	36	29	55	41	54	53	60	54
80	40	83	35	49	89	58	71	63	73	93	107	65	76
81	53	62	40	70	80	65	62	69	62	83	80	60	69
82	53	60	44	47	64	56	48	53	50	44	51	68	61
83	50	55	42	54	46	56	64	71	47	64	65	70	64
84	50	48	55	52	68	69	83	94	59	79	73	55	54
85	43	53	66	65	68	78	83	78	59	83	74	48	60
86	46	60	61	44	48	55	60	67	67	75	78	68	47
87	53	58	38	57	72	55	57	80	56	71	71	65	62
88	70	44	53	49	41	62	50	59	56	44	48	70	32
89	53	64	49	54	70	64	71	69	70	60	53	58	49
90	46	73	53	62	60	64	79	80	79	75	84	86	54
91	53	62	62	57	68	64	69	57	65	64	69	55	51
92	63	62	14	77	94	78	62	59	53	73	59	38	68
93	43	64	49	49	70	60	74	71	62	73	53	53	62
94	43	62	53	49	58	58	62	53	59	56	65	73	46
95	40	62	48	44	72	49	71	63	59	56	71	42	62
96	46	64	48	52	70	60	67	78	73	69	76	60	54
97	50	53	68	57	53	65	69	74	56	56	75	55	52
98	46	58	49	39	92	58	60	61	47	89	74	53	63
99	46	55	57	49	56	56	64	69	53	54	50	55	45
100	50	66	49	36	63	49	69	74	62	77	88	83	56

APPENDIX B (continued)

MMPI Scores of Subjects

Subj. No.	Scores on MMPI Scales												
	L	F	K	1	2	3	4	5	6	7	8	9	0
101	50	46	55	65	72	65	60	57	50	60	63	63	65
102	43	53	61	57	53	64	50	78	70	75	57	53	55
103	50	68	61	57	60	73	60	73	56	60	63	65	41
104	36	62	53	57	80	71	79	59	59	77	82	53	47
105	46	70	42	39	75	53	64	78	56	83	82	86	63
106	46	90	42	80	96	73	100	63	91	91	119	88	53
107	53	58	46	59	80	62	64	71	56	69	63	48	72
108	46	76	38	41	53	49	83	57	70	75	73	75	61
109	40	60	46	54	68	58	69	73	65	73	76	68	60
110	46	58	49	41	63	49	74	57	62	64	63	58	52
111	53	50	55	41	43	53	48	73	53	54	44	65	42
112	50	86	40	54	94	55	76	78	70	81	99	58	68
113	40	58	48	57	60	51	60	76	53	62	59	48	54
114	40	76	44	72	96	78	83	57	67	97	101	63	76
115	56	48	66	70	53	67	69	63	50	62	63	75	51
116	46	68	57	54	70	55	76	73	59	60	63	50	72
117	46	44	68	67	77	73	71	52	56	60	53	70	36
118	60	55	59	47	77	53	60	73	50	62	61	45	68
119	53	64	48	52	60	69	88	65	76	69	80	83	63
120	36	62	53	65	84	73	64	71	47	75	71	50	58
121	40	60	51	54	63	65	67	82	59	75	74	75	47
122	60	76	40	80	82	75	71	74	62	75	74	65	77
123	53	53	59	54	46	51	55	71	59	58	53	50	51
124	50	60	55	82	72	75	57	82	76	60	65	55	75
125	43	50	48	49	53	58	62	59	56	56	42	53	53

APPENDIX B (continued)

MMPI Scores of Subjects

Subj. No.	Scores on MMPI Scales												
	L	F	K	1	2	3	4	5	6	7	8	9	0
126	43	68	44	88	68	78	71	67	62	73	74	73	51
127	50	73	51	49	77	53	60	53	59	85	82	28	70
128	56	48	64	49	56	58	67	82	53	60	71	70	49
129	50	80	49	85	84	78	81	71	79	97	105	65	55
130	40	58	59	59	65	64	64	63	44	64	63	58	45
131	56	68	61	47	58	76	95	59	62	70	97	73	52
132	56	55	62	52	75	69	71	80	76	81	74	55	64
133	40	73	60	41	80	51	60	61	47	71	53	33	66
134	36	64	40	34	65	42	64	63	50	81	92	53	75
135	46	68	59	77	96	98	81	80	79	103	94	49	50
136	50	70	49	62	84	73	76	69	67	71	57	65	51
137	46	60	49	49	99	64	74	78	65	78	74	43	82
138	43	60	49	75	89	76	76	67	73	87	74	60	58
139	46	78	40	70	99	73	76	71	85	101	101	55	73
140	43	66	38	65	87	60	62	71	62	83	80	63	68
141	56	53	49	52	70	69	60	84	67	62	51	40	45
142	53	55	62	57	65	65	76	67	53	75	74	58	53
143	36	64	48	62	60	47	88	49	62	60	57	65	44
144	40	58	64	57	70	56	71	80	59	77	73	65	49
145	63	55	51	52	70	60	48	61	62	56	50	48	75
146	53	60	48	49	77	67	74	86	67	79	80	53	70
147	40	86	38	62	84	65	76	74	59	81	90	52	75
148	43	58	51	49	72	53	71	74	59	64	69	60	73
149	53	53	44	44	68	42	48	69	38	44	38	48	45

Note. MMPI scores are T-scores after K-correction.

[a]Subjects Nos. 1-64: females; 65-149: males.

APPENDIX C

Rorschach Scores of Subjects

Table A

Location and Content Scores

Subj. No.[a]	R	W	D	Dd	PS	SS	Ct
1	9	7	2	0	0	0	5
2	30	6	24	0	0	0	10
3	15	6	4	5	0	1	6
4	22	3	17	2	0	0	7
5	23	11	10	2	0	1	10
6	10	5	4	1	0	2	5
7	18	10	8	0	0	0	6
8	24	1	18	5	0	0	5
9	19	5	13	1	0	0	6
10	30	5	21	4	0	0	9
11	39	7	29	3	0	0	8
12	31	8	19	4	0	0	9
13	22	3	19	0	1	0	8
14	46	28	16	2	1	2	15
15	13	6	7	0	0	1	5
16	40	11	26	3	6	1	13
17	15	8	7	0	1	1	6
18	26	7	15	4	0	1	9
19	47	9	33	5	2	3	18
20	13	4	7	2	0	1	7
21	19	9	9	1	2	3	9
22	27	8	17	2	0	1	11
23	18	9	7	2	0	2	7
24	22	13	9	0	0	0	8
25	30	12	17	1	0	1	12

APPENDIX C

Rorschach Scores of Subjects

Table A (continued)

Location and Content Scores

Subj. No.[a]	R	W	D	Dd	PS	SS	Ct
26	68	25	39	4	1	9	19
27	11	8	2	1	0	2	5
28	17	10	5	2	0	2	5
29	7	6	1	0	0	0	4
30	23	4	18	1	0	1	6
31	12	7	5	0	0	0	5
32	15	5	9	1	0	0	4
33	14	10	4	0	1	1	7
34	12	5	6	1	0	0	5
35	31	1	21	9	1	0	11
36	11	6	2	3	0	2	6
37	12	6	5	1	0	0	5
38	18	5	12	1	0	0	7
39	26	3	13	10	0	1	11
40	21	4	14	3	0	1	8
41	40	3	25	12	3	1	12
42	14	8	6	0	0	1	6
43	27	2	23	2	1	0	7
44	17	11	4	2	0	2	6
45	16	6	10	0	0	0	7
46	42	8	29	5	2	1	11
47	14	5	8	1	0	1	9
48	9	9	0	0	1	2	5
49	32	15	13	4	0	3	9
50	39	14	18	7	0	1	14

APPENDIX C

Rorschach Scores of Subjects

Table A (continued)

Location and Content Scores

Subj. No.	R	W	D	Dd	PS	SS	Ct
51	37	14	20	3	1	4	11
52	10	6	3	1	0	0	4
53	10	7	3	0	0	0	5
54	33	9	19	5	1	1	12
55	12	7	3	2	0	0	5
56	47	10	29	8	0	2	13
57	13	7	6	0	0	1	6
58	10	4	6	0	0	0	4
59	19	8	10	1	0	1	8
60	22	6	12	4	0	4	10
61	27	9	15	3	2	0	12
62	12	8	3	1	0	0	8
63	11	4	7	0	0	2	9
64	30	7	20	3	3	1	11
65	38	15	19	4	0	9	15
66	21	5	16	0	0	3	9
67	27	3	24	0	1	0	9
68	14	9	5	0	0	1	7
69	22	8	10	4	0	1	8
70	31	14	14	3	2	3	13
71	13	8	5	0	0	0	6
72	22	11	8	3	0	3	7
73	12	6	4	2	0	1	4
74	11	10	1	0	0	2	6
75	18	7	8	3	0	1	8

APPENDIX C

Rorschach Scores of Subjects

Table A (continued)

Location and Content Scores

Subj. No.	R	W	D	Dd	PS	SS	Ct
76	18	6	8	4	1	0	7
77	10	6	3	1	0	1	3
78	39	6	29	4	1	1	13
79	21	10	8	3	0	3	8
80	97	19	66	12	1	2	16
81	35	12	20	3	1	3	11
82	25	4	17	4	1	3	12
83	25	6	18	1	0	1	10
84	28	6	20	2	0	0	10
85	21	12	6	3	0	0	8
86	14	6	8	0	0	0	7
87	22	5	16	1	0	0	6
88	21	11	8	2	0	4	9
89	21	8	12	1	1	2	10
90	145	14	91	40	11	8	19
91	31	7	21	3	0	2	11
92	14	9	5	0	0	0	7
93	16	6	10	0	0	0	6
94	14	4	10	0	0	0	5
95	13	7	6	0	0	1	5
96	47	8	33	6	2	0	15
97	12	6	5	1	0	0	6
98	23	6	14	3	0	5	7
99	16	8	7	1	1	2	7
100	18	7	9	2	1	1	11

APPENDIX C

Rorschach Scores of Subjects

Table A (continued)

Location and Content Scores

Subj. No.	R	W	D	Dd	PS	SS	Ct
101	17	3	13	1	1	0	
102	26	6	19	1	0	1	
103	47	14	32	1	0	6	
104	11	11	0	0	0	0	
105	39	10	26	3	0	2	
106	13	6	7	0	0	0	
107	44	3	31	10	5	1	
108	12	6	4	2	0	0	
109	13	3	8	2	1	2	
110	20	2	13	5	0	1	
111	33	14	17	2	1	1	
112	10	7	3	0	1	0	
113	47	35	8	4	0	6	
114	13	6	7	0	0	0	
115	18	3	11	4	0	0	
116	18	3	13	2	0	1	
117	21	9	10	2	0	0	
118	25	6	15	4	0	3	
119	46	10	23	13	1	2	
120	19	9	9	1	0	2	
121	39	12	20	7	1	2	
122	31	16	14	1	1	1	
123	41	3	26	12	4	0	
124	20	10	8	2	0	1	
125	10	6	3	1	0	0	

APPENDIX C

Rorschach Scores of Subjects

Table A (continued)

Location and Content Scores

Subj. No.	R	W	D	Dd	PS	SS	Ct
126	9	4	4	1	0	0	3
127	27	12	10	5	0	2	12
128	32	14	18	0	0	2	8
129	17	3	12	2	2	0	10
130	26	8	16	2	0	0	12
131	28	10	16	2	1	2	12
132	15	7	8	0	0	0	7
133	19	8	10	1	0	0	6
134	20	6	9	5	1	1	5
135	30	12	14	4	2	1	13
136	38	25	7	6	0	2	13
137	19	5	9	5	1	0	6
138	40	4	31	5	1	0	13
139	19	5	14	0	0	0	8
140	28	16	10	2	0	0	11
141	21	6	12	3	1	2	7
142	14	11	1	2	0	2	6
143	41	30	10	1	0	1	14
144	143	3	49	91	14	2	24
145	27	12	13	2	1	0	10
146	43	16	27	0	1	0	9
147	12	9	3	0	0	1	6
148	19	5	13	1	0	1	7
149	15	10	4	1	0	0	5

APPENDIX C

Rorschach Scores of Subjects

Table A (continued)

Location and Content Scores

Note. R = Total number of responses

W = Number of Whole responses

D = Number of Common Detail responses

Dd = Number of Unusual Detail responses

PS = Number of Primary Space responses

SS = Number of Secondary Space responses

Ct = Number of Content categories used

[a]Subjects Nos. 1-64: females; 65-149: males.

APPENDIX C

Rorschach Scores of Subjects

Table B

Determinant Scores

Subj. No.[a]	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+/Fr	(2)	FD	F
1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	0	6
2	4	3	1	0	3	1	0	0	0	0	0	2	0	0	0	1	2	0	11	1	16
3	0	3	0	1	2	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	9
4	3	2	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	6	0	14
5	2	2	0	1	4	4	0	1	0	0	0	3	0	1	0	1	2	0	3	0	7
6	3	5	0	0	1	2	0	0	0	0	0	2	0	0	0	0	0	0	4	1	0
7	1	3	1	0	3	1	0	0	0	0	0	0	0	0	1	1	2	0	9	0	9
8	3	1	0	0	0	2	0	0	1	0	0	0	0	0	0	0	2	0	12	0	15
9	3	5	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	11	1	8
10	7	4	0	1	3	0	0	0	0	0	0	0	0	0	0	1	3	0	14	0	12
11	1	4	0	0	3	3	0	0	0	0	0	2	0	0	1	0	1	0	6	0	23
12	2	2	1	0	1	4	0	0	0	0	0	0	0	1	0	1	1	0	9	0	21
13	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	17
14	4	2	2	2	3	3	0	0	0	0	1	1	1	3	0	2	2	0	6	0	24
15	3	4	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	4	0	4

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+ Fr	(2)	FD	F
16	4	4	0	0	0	4	0	0	0	0	0	1	0	3	0	0	0	2	5	0	26
17	0	1	2	0	0	4	0	0	1	0	0	1	0	0	0	0	0	0	4	2	8
18	5	5	4	0	2	2	0	0	1	0	0	2	0	2	0	0	1	0	10	0	10
19	3	6	5	0	2	6	0	0	1	0	0	2	0	2	0	2	3	0	5	0	19
20	2	3	0	0	1	0	0	0	0	0	0	3	0	0	0	0	1	0	6	0	5
21	3	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3	1	0	5	0	10
22	2	8	0	0	0	2	0	0	0	0	1	4	1	1	0	0	3	0	11	1	8
23	2	4	0	0	1	2	0	0	0	0	0	2	0	0	0	0	3	1	5	0	6
24	2	2	1	0	4	2	0	0	0	0	0	5	1	1	0	0	0	0	8	0	8
25	3	3	3	0	4	3	0	0	0	0	0	1	0	2	0	2	5	0	8	2	7
26	8	10	6	0	5	9	0	1	3	0	0	5	0	6	0	1	7	1	14	1	20
27	0	2	0	0	1	1	0	0	0	0	0	1	0	1	0	0	1	0	2	0	5
28	3	6	1	0	0	0	0	0	1	0	0	1	0	1	0	0	3	5	5	0	4
29	0	0	0	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
30	2	4	0	0	0	2	0	0	1	0	0	1	0	0	0	0	2	0	9	0	11

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+ Fr	(2)	FD	F
31	1	0	0	0	2	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	6
32	2	4	0	0	3	0	0	0	0	0	0	1	0	1	0	0	0	2	9	0	4
33	1	1	0	0	5	1	0	0	0	0	0	0	0	0	0	0	1	0	2	0	4
34	6	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	7	0	2
35	2	6	2	0	1	1	0	0	0	0	0	1	0	0	0	0	3	0	5	1	16
36	0	3	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0	3	0	4
37	1	2	1	0	1	2	0	0	1	0	0	1	0	0	0	0	1	0	6	1	4
38	2	2	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	7	0	10
39	2	4	1	2	0	2	0	0	0	0	0	0	0	1	1	1	3	0	8	0	11
40	2	6	1	0	3	1	0	0	1	0	2	0	0	1	0	0	2	2	7	2	3
41	9	9	1	0	2	3	0	0	0	0	0	0	0	0	0	0	3	0	17	2	16
42	1	3	1	0	0	1	0	0	0	0	0	2	0	0	0	0	1	0	3	1	5
43	1	5	0	0	1	0	0	0	2	0	0	0	0	0	0	1	1	0	15	0	16
44	0	0	0	0	3	0	0	1	0	0	2	1	0	0	0	3	2	0	1	0	8
45	0	6	0	0	1	2	0	0	0	0	2	0	0	0	0	0	0	0	7	0	5

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+ Fr	(2)	FD	F
46	2	2	0	1	3	1	0	0	0	0	1	2	0	0	0	1	4	0	3	0	26
47	3	2	0	0	2	2	0	0	1	0	0	2	0	0	0	1	2	0	3	0	1
48	3	5	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	1	1	0
49	2	6	0	0	1	2	0	0	0	0	1	6	0	1	0	0	2	1	9	1	15
50	3	6	7	1	2	7	0	0	2	1	0	1	0	3	1	4	7	3	7	1	6
51	0	6	0	0	3	3	0	0	0	0	1	3	0	3	1	3	3	1	6	1	13
52	1	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	4	0	5
53	2	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	1	5
54	5	9	0	0	0	6	0	0	2	0	0	4	0	1	0	0	1	0	12	0	10
55	2	2	0	0	0	3	0	0	0	0	0	2	0	1	0	1	2	0	5	1	5
56	4	8	0	1	3	1	0	0	2	0	1	2	0	0	0	2	0	0	11	0	25
57	2	2	1	1	1	0	0	0	0	0	0	2	0	0	0	0	0	1	5	1	4
58	4	3	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	5	1	2
59	2	2	0	2	2	3	0	0	1	0	1	1	0	1	0	0	0	0	5	1	6
60	2	0	0	0	1	3	0	0	1	0	0	2	0	0	0	0	0	0	7	0	14

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	EC'	T	TF	FT	VF	FV	Y	YF	FY	rF+ Fr	(2)	FD	F
61	5	3	0	0	2	4	0	0	0	0	0	4	0	4	0	2	0	0	4	1	9
62	3	2	1	0	2	0	0	0	1	0	0	1	1	0	0	2	3	0	4	1	2
63	2	0	0	0	1	0	0	0	0	0	0	1	0	1	0	1	1	0	5	0	5
64	1	3	0	0	1	5	0	0	2	0	0	4	0	4	0	0	5	1	3	0	12
65	8	8	1	0	1	5	0	0	0	0	0	4	0	6	0	3	8	1	8	0	5
66	0	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	1	14
67	2	5	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	2	4	0	18
68	1	2	2	1	4	1	0	0	0	0	0	1	0	0	0	0	3	0	2	0	3
69	1	2	0	0	1	3	0	1	0	0	1	3	0	0	0	1	0	0	3	1	9
70	3	5	4	3	1	0	0	1	0	0	0	2	0	2	2	1	0	0	3	0	13
71	4	2	1	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	2
72	1	2	1	0	1	2	0	1	1	0	0	3	0	0	0	1	1	0	4	0	9
73	1	2	0	0	1	3	0	1	0	0	0	0	0	1	0	1	0	0	5	0	5
74	3	0	0	1	0	3	0	0	0	0	0	1	0	0	0	0	1	0	1	0	3
75	2	7	2	2	2	4	0	0	0	0	0	4	0	0	1	1	0	0	5	0	2

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+/Fr	(2)	FD	F
76	1	5	0	0	0	4	0	0	0	0	0	2	0	0	0	0	5	0	4	0	3
77	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	4
78	2	2	0	0	2	3	0	0	0	0	1	1	0	0	0	0	2	0	5	0	25
79	2	7	0	0	0	2	0	0	1	0	0	0	0	0	0	0	5	0	6	0	6
80	8	13	4	1	20	10	0	0	0	0	7	2	0	4	0	3	11	0	21	0	30
81	6	0	0	0	3	3	0	0	1	0	0	3	0	4	0	0	0	0	9	0	17
82	3	1	0	0	2	0	0	0	1	0	0	2	0	2	0	0	1	4	3	0	16
83	4	2	1	0	1	3	0	0	0	0	0	0	0	1	0	1	0	0	7	0	16
84	1	2	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	8	0	22
85	1	1	0	1	5	1	0	1	0	0	0	0	1	1	0	0	0	0	7	0	10
86	3	4	0	1	0	2	0	0	0	0	0	0	0	1	0	0	2	0	6	0	3
87	3	6	0	0	1	4	0	0	2	0	0	2	0	2	0	0	0	0	15	1	9
88	0	2	0	1	1	4	0	0	1	0	0	1	0	1	0	0	0	0	2	1	11
89	2	2	0	0	2	1	0	0	2	0	0	0	0	1	0	2	0	0	4	1	10
90	5	6	3	0	4	5	0	0	0	0	0	0	0	2	0	2	1	1	10	1	106

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+/Fr	(2)	FD	F
91	0	5	0	0	3	1	0	0	0	0	0	2	1	2	0	1	3	0	4	0	12
92	2	2	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	5	1	6
93	6	4	0	0	0	3	0	0	0	0	0	5	0	1	0	0	0	0	6	1	0
94	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	1	11
95	4	3	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	7	1	3
96	3	3	6	0	4	1	0	0	0	0	3	5	0	6	0	0	1	0	7	2	21
97	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	0	6
98	0	5	0	0	1	2	0	0	0	0	1	4	0	0	0	0	2	0	2	1	11
99	1	2	1	0	0	1	0	0	0	0	0	2	0	0	0	0	0	2	1	0	8
100	3	2	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	6	2	10
101	2	3	0	0	0	0	0	0	1	0	0	3	0	1	0	0	0	0	9	0	11
102	1	0	0	0	2	9	0	0	1	0	0	1	0	1	0	0	1	0	5	0	10
103	2	6	1	2	2	2	0	0	1	1	8	6	0	1	0	0	0	0	11	0	16
104	0	0	0	0	0	3	0	0	1	0	0	1	0	0	0	0	2	0	0	0	5
105	2	0	2	0	0	10	0	0	0	0	0	2	0	2	0	0	1	0	9	0	26

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+ Fr	(2)	FD	F
106	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	3
107	2	13	5	0	0	5	0	0	1	0	0	1	0	0	0	1	2	3	8	2	19
108	3	0	1	0	1	2	0	0	0	0	0	1	0	0	0	0	2	3	3	0	7
109	1	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	5	1	6
110	2	6	1	0	1	0	0	0	1	0	1	1	0	1	0	3	2	0	9	0	5
111	2	1	1	0	3	1	0	0	1	0	1	1	1	2	0	1	5	0	4	0	17
112	0	2	0	0	3	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	4
113	14	17	3	0	9	8	0	0	3	0	0	0	0	1	0	4	3	0	15	1	5
114	2	2	0	0	2	0	0	0	0	0	1	0	0	0	0	0	1	0	6	0	5
115	1	1	1	0	1	0	0	0	2	0	1	0	0	0	0	1	2	0	9	2	8
116	3	1	0	0	3	0	0	0	0	0	0	1	0	0	0	0	1	0	6	0	8
117	1	9	0	0	1	1	0	0	2	0	0	0	0	0	0	0	2	4	9	1	7
118	4	3	1	0	2	1	0	0	0	0	0	0	0	1	0	0	3	1	9	2	10
119	5	2	0	0	2	3	0	0	0	0	0	0	1	2	0	1	4	0	18	0	29
120	2	3	1	1	2	3	0	0	0	0	0	1	0	1	0	2	0	0	7	0	7

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+/Fr	(2)	FD	F
121	6	3	4	0	1	1	0	0	2	0	0	0	0	3	0	1	5	0	5	1	17
122	0	2	0	1	2	2	0	0	1	0	0	1	0	1	1	3	2	5	6	0	13
123	5	7	1	0	2	3	0	0	0	0	0	0	0	3	0	0	2	0	11	0	22
124	4	7	0	0	1	3	0	0	1	0	0	1	0	0	0	0	1	0	4	1	6
125	2	5	0	0	1	3	0	0	0	0	0	0	0	0	0	0	1	0	4	1	1
126	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1
127	3	6	0	0	4	3	0	0	0	0	0	2	0	3	0	1	7	1	4	0	10
128	6	4	0	0	0	5	0	0	2	0	0	2	0	1	0	0	1	1	11	1	14
129	2	1	2	0	1	0	0	0	2	0	0	2	0	0	0	1	3	1	4	0	7
130	2	6	1	0	0	1	0	0	0	0	0	1	0	0	0	1	1	1	6	2	13
131	2	0	1	1	1	2	0	0	1	0	0	0	0	0	0	3	4	0	2	0	14
132	2	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0	8
133	1	2	0	0	4	0	0	0	1	0	1	1	0	0	0	0	0	0	7	0	11
134	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	16
135	5	5	3	0	2	7	0	0	0	0	1	2	0	2	0	0	5	2	8	0	7

APPENDIX C

Rorschach Scores of Subjects

Table B (continued)

Determinant Scores

Subj. No.	M	FM	m	C	CF	FC	C'	C'F	FC'	T	TF	FT	VF	FV	Y	YF	FY	rF+/Fr	(2)	FD	F
136	2	4	4	0	1	12	0	0	0	0	0	5	1	5	0	2	6	4	3	2	10
137	5	9	1	0	0	2	0	0	0	0	0	1	0	0	0	0	4	0	4	0	2
138	2	8	3	0	3	1	0	0	1	0	0	1	0	2	0	0	2	0	9	0	22
139	1	1	0	0	0	2	0	0	0	0	0	3	0	3	0	0	0	0	2	1	9
140	5	5	3	0	1	2	0	0	0	0	0	2	0	0	0	1	2	0	10	0	13
141	3	8	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	8	3	5
142	3	1	1	0	3	2	0	0	2	0	1	1	0	0	0	1	0	0	2	0	4
143	1	5	2	0	6	7	0	2	1	0	3	1	0	1	0	1	4	0	3	2	12
144	11	8	3	0	0	5	0	0	0	0	0	5	0	11	0	0	1	0	45	0	103
145	3	6	2	0	3	2	0	0	3	0	0	4	0	0	0	0	1	0	5	0	9
146	1	3	1	4	6	3	0	0	3	0	0	2	1	1	0	2	0	0	7	0	19
147	3	2	0	1	2	1	1	0	0	0	0	0	1	0	0	0	0	0	2	0	3
148	4	3	0	0	0	2	0	0	0	0	0	3	0	3	0	0	2	2	4	0	5
149	1	1	1	0	3	0	0	0	1	0	0	1	0	0	0	0	2	0	2	0	7

APPENDIX C

Rorschach Responses of Subjects

Table B (continued)

Determinant Scores

Note. M = Number of Human Movement responses

FM = Number of Animal Movement responses

m = Number of Inanimate Movement responses

C = Number of pure Color responses

CF = Number of Color-Form responses

FC = Number of Form-Color responses

C' = Number of pure Achromatic Color responses

C'F = Number of Achromatic Color-Form responses

FC' = Number of Form-Achromatic Color responses

T = Number of pure Texture responses

TF = Number of Texture-Form responses

FT = Number of Form-Texture responses

VF = Number of Vista-Form responses

FV = Number of Form-Vista responses

Y = Number of pure Diffuse Shading responses

YF = Number of Diffuse Shading-Form responses

FY = Number of Form-Diffuse Shading responses

rF + Fr = Number of Reflection-Form and Form-Reflection responses

(2) = Number of Pair responses

FD = Number of Form-Dimensionality responses

APPENDIX C

Rorschach Responses of Subjects

Table B (continued)

Determinant Scores

F = Number of pure Form responses

No V, or pure Vista responses, occurred in any of the protocols.

[a]Subjects Nos. 1-64: females; 65-149: males.