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Rorschach and MMPI Correlates of Rorschach Form Level

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RORSCHACH AND MMPI CORRELATES OF RORSCHACH FORM LEVEL

by

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VITA

The author, Mark Henry Pedrotty, is the son of Paul Charles Pedrotty, Sr. and Adeline (Brooks) Pedrotty. He was born June 15, 1960, in Boston, Massachusetts.

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TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

LIST OF TABLES

INTRODUCTION

College students at a Private Midwestern Jesuit University who volunteer to take a battery of personality tests for training purposes in exchange for course credit were found to exhibit significantly lower than normal scores in good form quality on the Rorschach (Exner, 1986). Form quality as measured on the Rorschach is believed to indicate perceptual accuracy and to be related to ego functioning. This study is correlative in nature. It seeks to: a) measure the overall deviancy in form quality of the volunteer's Rorschach protocols as compared to Exner's norms (1986); and b) assess if the scores on form quality and other scores in the subjects' protocols hypothesized to be related to form quality are indicative of any specific personality styles.

The Rorschach

Since the inception of the Rorschach Inkblot Test in 1922 by Hermann Rorschach, it has been used to describe an individual's personality structure. Reflective of the complexity of personality, the indices and ratios gleaned from a protocol are combined and related to each other in an variety of different ways to describe a person's personality. The direction of relatedness between the

variables is variant and dependent upon their individual meaning and relation to other variables. For example, a high number of responses can mean that the subject was very involved in the test. However, an accompanying high frequency of pure form responses (i.e., responses that only utilize the contours of the blot to define the percept) would suggest that the subject was uninvolved with the test and that he might be very constricted in his response style. Thus, no one indicator or ratio is wholly interpretable individually, although some may have more meaning or significance than others.

Perception and Its Measurement in the Rorschach

Rorschach's work. One of the cornerstone ratios on the Rorschach is form quality. Rorschach (1964) conceptualized the inkblot test (originally named the Form Interpretation Test) as a test of perception or apperception. He did not believe that it was a test of free-association or imagination, although imagination is involved in it.

Rorschach believed that three processes were involved in perception: sensation, memory and association (Rorschach, 1964). The subject has to first acknowledge that the stimulus is an inkblot so that he can search his memory and finally associate engrams with the stimulus. The type of association that occurs depends on the level of

consciousness of the process. The perception is considered to be strictly apperception when it occurs at an unconscious level and as interpretation when it occurs at a conscious level (Rorschach, 1964).

To assess the integrity of perception, Rorschach (1964) divided responses into form related and non-form related responses. Form related responses refer to the subject's use of the contours of the blot to articulate his response. To measure the accuracy of perception, form related responses were categorized as good or poor. To avoid wholly biasing the classification of form visualization by subjective judgment, Rorschach used a statistical criterion to establish a "definite range of normal visualization" (Rorschach, 1964, p.23). He used a sample of 100 normal subjects to create his reference of normal response (Rorschach, 1964). From this range, responses were judged either as good as the frequently occurring percepts (F+) or as relatively poor (F-). An F+% was calculated from the total number of pure form responses produced (F+/total F). Rorschach did not include in the F+% the assessment of form visualization for responses that involved movement (M) or color (C). Rorschach (1964) scored only the determinants of form, movement and color in his original work.

Rorschach also included both the quality and quantity of original responses in his psychogram (Rorschach, 1964).

Original responses are any responses that occur once or fewer times in 100 protocols. "They are judged as either + or - according to the quality of the M, F, or FC of the respective interpretation" (Rorschach, 1964, p.47).

Rorschach (1964) found that depressives and pedants seemed to be very aware of the assimilative process of perception and had very high F+% while feebleminded, organics, and manics had low F+% and seemed unaware of the assimilative process of perception. Thus, Rorschach (1964) concluded that awareness of the assimilative process is positively related with acuity of perception.

Rorschach's focus on the goodness of fit, form quality, of the reported association to the blot was underscored by his belief in the intellectual processes necessary for perceptual mediation of stimuli. He established an approximated or rough consensual criteria to evaluate the goodness of perception because of the importance he gave to psychosocial experiences in perception. In other words, he believed that form visualization is guided by intellectual integrity, capacity, and talent and environmental experiences.

Exner's Comprehensive System. Exner, having studied many of the different Rorschach systems created and/or developed since Rorschach's untimely death in 1922, selected a statistical system, similar to Rorschach's, to evaluate

form quality. His form level system is a compromise between Mayman's qualitative system and Beck's consensual system (Exner, 1986). Using seven different levels of form quality, Mayman (1968) sought to measure the "range and general level, the fluctuations and flaws, in a person's capacity to test reality" (p. 3). He construed the Rorschach as an opportunity to either relax one's adherence to reality (i.e., creatively or unwillingly) or to remain rigidly adhered to reality. Although Mayman's system received empirical support for its ability to categorize different modes of reality adherence (see Mayman, 1968 for a review) and to differentiate psychotic from nonpsychotic subjects (Harder & Ritzler, 1979), its inter-rater reliability was extremely variant across the seven levels. Inter-rater reliability ranged from 43% (F-) to 93% (Fo) in a study by Lohrenz and Gardner (1967) and from 41 to 83% in a pilot study by Exner (1986). The lower inter-rater reliability found by Exner is probably attributable to the brief tutorial and conflict with Beck's dichotomous system.

To maintain an acceptable level of inter-rater reliability for research purposes, Exner (1986) modified Mayman's seven level system, by grouping together individual levels of form quality with low reliability and similar traits, to produce a four level system. Exner's four levels are, superior form (+), ordinary form (o), unusual form (u) and minus form (-). The new levels of

form quality have high inter-rater reliability ranging from 87 to 95% (Exner, 1986). In a study by Kinder, Brubaker, Ingram and Reading (1982) comparing Exner's and Beck's form level systems using a sample of psychiatric patients, Exner's system produced a significantly higher X+% score than Beck's system. However, both scores were comparable with only a five point difference between them. No significant difference was found between systems for F+%. Thus Exner's and Beck's system of scoring form level are comparable in X+% and F+%. Exner has successfully created a form-level system with a high inter-rater reliability and high similarity with an existing dichotomous consensual form-level system.

Exner's criteria for scoring form quality. Exner (1986) constructed a Form Quality table using 7500 protocols with a total of 162,427 responses. The table provides a listing of location of percept, general categories of responses and specific responses, and the form quality assigned to listed percepts for each blot. Adult nonpatients, nonschizophrenic outpatients and nonschizophrenic-nonpsychotic inpatients were selected for the sample with 2500 protocols obtained from each group.

Exner (1986) primarily applied a statistical criteria to score ordinary, unusual and minus responses. A qualitative criterion was used to score all superior

responses and some minus responses. A superior response had to be first judged to be an ordinary response and then be sufficiently elaborated to be scored superior.

A response was judged a minus if the percept was not congruent enough, a poor overall fit, with the contours of the blot or if lines were added to close off the contours of the blot to form some percept, such as a face. A response was also judged to be a minus if it occurred at a very low frequency and was not readily observable.

Unusual responses are those percepts that were reported with a frequency of less than two percent of the 7500 protocols, were unanimously judged as readily observable by three independent judges, and were without any gross distortions of contours.

Ordinary responses are those that were reported in at least two percent of the 7500 protocols using whole or frequently seen areas, or 66 percent of areas seen less than two percent of the time, and do not violate the contours of the blot.

For percepts that can not be easily extrapolated from Exner's Form Quality table, raters can only chose between unusual and minus form levels. Exner (1986) suggests that it is best to score questionable responses minus, because minus responses are rare in typical protocols and a few minus responses will not have a large impact on the interpretation of a protocol.

Thus, Exner strengthened Rorschach's original system by adding a rigorous statistical criterion with tables to help objectify the scoring of form quality. He also separated the original responses (unusual) from the overall class of good form quality, so that unusual responses are a dependent measure (i.e., the percentage of unusual responses is directly related to the percentage of good and poor responses).

Form Quality Ratios, Expected Frequencies and Reliability

Exner's (1986) work on standardization of the Rorschach for administration and scoring has helped improve its researchability. He has created frequency tables composed of indices and ratios for children, adolescents, normal nonpatient adults, schizophrenics, depressives, and subjects with character problems. Frequencies for all four levels of form quality are tabulated for both pure form (F+, Fo, Fu, F-) and all form related responses (X+, Xo, Xu, X-).

Ratios of F+% (number of F+ & Fo responses/total number of pure F responses), X+% (number of X+ & Xo responses/total number of form responses), and X-% (number of X- responses/total number of form responses) are also computed and tabulated and used as the primary indicator of perceptual accuracy. X+% is considered to be more reality oriented than F+% because it includes all form related

responses (color, shading, and movement). Exner (1986) found X+% to be similar in value as F+% and helpful in discriminating among different clinical groups.

Form quality, unlike any other measure in the Rorschach, is relatively consistent for all nonpatient groups of children, adolescents, and adults (Exner, 1986). The mean X+% from the age of five years through adulthood is .83 and the standard deviation is about .10. The mean X-% ranges from .04 to .08 with a standard deviation between .04 and .06 percent (Exner, 1986).

Exner (1986) found that X+% and X-% is consistent across age and that there are anywhere from 10 to 31% of each age group that have an X+% below 70% (i.e., below one standard deviation from the mean). In addition, Exner (1986) has reported temporal reliability in the mid .80's to low .90's over both brief and long periods of time. Thus, from these data, form quality for nonpatients seems to be a robust and stable measure. Exner (1986) states that X+% is "the only variable that has consistently high long-term retest reliability during the developmental years" (p. 418).

The Meaning of Form Quality in the Rorschach

Rorschach (1964) believed that the perceptual abilities of an individual are important to his functioning in the world. In his original work, Rorschach (1964) found

that quantity and quality of form visualization differed with level of intelligence. He believed that perceptual accuracy (as measured by form quality) was a necessary component of intelligence. He thought the frequency and accuracy of the use of form and percent of original responses indicated different levels of adaptability. Rorschach (1964) stated that:

> A high percentage of good form presumes, first,... a real ability to concentrate; only when this ability is present are clear perceptions possible ... Secondly, the engrams must be clear, for if the memory images are not definite, accurate form visualization will be impossible ... Third, the ability to recall into consciousness, to 'bring to mind', clear memory images... Fourth, there must be an ability to select the most fitting of the various similar images which arise...it may be concluded that the F percentage is an indicator of the clarity of certain-perhaps all-associative processes, and of the length of the span of attention and the ability to concentrate. This is, then, the first component of intelligence (p. 56-57).

Rorschach believed that original responses depended on both the processes of attention and the clarity of the engrams to allow "optimum variability or freedom of association of the engram" (1964, p.63). He asserted that they provide information on the richness of the subject's experience. As shown in Table 1, Rorschach (1964) concluded from his data that good form visualization (F+%) ranges from 60 to 100% for people with intact mental abilities and no mental illnesses. Form quality differed with mental illness and impaired mental abilities. He also concluded that the optimal amount of original responses was less than 50%.

Table 1. Ranges of Good Form-Visualization and Original Respsonses Across Different Categories of Mental Illnes (Rorschach, 1964).

Mental Illness	F%	Original%
Normal:		
Artists	90-100%	30-50%+
Intelligent	80-100%	20-30%+
Average Intelligence	70-80%	0-20%±
Unintelligent	60-70%	0-20%−
Depressed Mood	80-100%	0-10%+
Manic Mood	60-70%	20-30% ∓
Oligophrenic:		
Morons	45-60%	30-40%-
Imbeciles	0-45%	40-70%-
Schizophrenic:		
Well preserved	70-90%	10-40%±
Stereotyped	60-80%	10-20%±
Scattered	40-60%	40-70%±
With Dementia Simplex	60-90%	0-20%±
Manic-Depressive:		
Depressed	80-100%	0-10%+
Manic	50-70%	10-30%∓
Epileptic:		
In Late Dementia	50-60%	20-40%∓
In Early Dementia	30-50%	40-50%∓
Organic:		
Korsakoff	60-70%	20-40%±
With Dementia Arteriosclerotics	60-70%	10-20%∓
Paretic	30-50%	40-50%-
With Dementia Senilis	0-30%	40-70%-

Note. F% = The sum of F+/the total number of F responses. Original% = The sum of original responses/ the total number of F responses.

Beck (1948) endorsed Rorschach's premise that form quality is the sine qua non of the intellect. His findings of the distribution of F+% was consonant with Rorschach's. Beck (1948) asserted that not only was a moderate to high frequency of good form quality important to intellectual functioning but it was crucial to the functioning of the ego. He stated that without a sufficient amount of F plus there is no ego (Beck, 1948). F plus is crucial to adapting to social rules and thus a value system which is essential for self respect (Beck, 1948).

Exner (1986) supports Beck's suggestion of adaptability to society and balance within oneself in his criterion for good form. For Exner (1986) a optimum frequency of good form indicates a person's willingness and ability to acknowledge convention, and to utilize and act in conventional ways, thus having appropriate relationships with others. A frequency of good form quality that is either extremely high or low indicates problems interpersonally and within oneself.

To summarize, Rorschach's classification of form quality, (good, poor, and original), and computation of frequency provided descriptive information of a person's intelligence, personality and richness of experience. Beck's (1948) finding that F+% varied with intelligence and personality supports Rorschach's premise that a balance of good form visualization and original answers is descriptive

of an intelligent and flexible individual. Beck (1948) made an additional assertion that F+% is a direct indicator of ego functioning. Exner (1986) also found a consistently constrained variation of good form quality within a sample of nonpatient adults and children. He asserted that good form quality indicates the subjects ability to give conventional responses. All of these researchers agree that a moderate to high level of good form quality is essential to a person's ability to appropriately function in society. Too high or too low a frequency of good form quality is indicative of problems in reality contact and thinking.

As listed in both Rorschach's (1964) and Beck's (1948) tables, frequencies of form quality have been used to indicate mental health and cognitive impairment. Weiner (1966) concluded from reviewing the literature that a F+% and R+% (R+% includes all form related responses and is identical to X+%) below 70% is cause for concern and a need for further assessment to determine if there are serious impairments in ego functioning, especially schizophrenia. An F+% or R+% below 60 indicates a schizophrenic impairment of reality testing. Research by Ricker-Ovsiankina and by Beck, both in 1938, found a mean F+% for schizophrenics to equal 66.9 and 61.5 and for controls to equal 87.3 and 83.9, respectively (Weiner, 1966) Subsequent research confirmed both of these researchers' findings (Weiner,

1966).

Exner (1986) underscored Weiner's conclusion with his own data that demonstrated that an X+% less than 70% indicates an unconventional translation of the world and when X+% is less than 60% it indicates a marked unconventional interpretation of the world with a great possibility of severe impairment in adjustment. This echoes Beck's premise that F+% measures ego functioning or one's ability to operate within a social network and have respect for one's self.

Important to interpretation of a low X+% is the cause of its depressed frequency. X+% may be low due to an elevation in unusual and or distorted responses. Unusual and distorted (i.e., poor) responses are indicative of different cognitive processes. It would be helpful to discuss the different meanings of frequency ranges of Xu% and X-%.

Unusual responses (Xu) are by definition infrequent yet readily seen. Rorschach (1964) called them original. Exner (1986) states that they indicate different levels of self-expression. Given at a frequency that results in an X+% less than 70% they indicate an excessive commitment to unconventional and possibly idiosyncratic perceptions and behaviors (Exner, 1986). For example, Exner (1986) found that in a sample of 868 subjects' protocols, who met the DSM-III criteria for asocial and antisocial behavior, X+%

was significantly lower for asocial and antisocial patients than for nonpatients. However, X-% was not significantly different. The antisocial and asocial subjects gave a greater number of unusual responses. This suggests a relationship between elevated frequency of unusual responses and unconventional or offensive behavior. However, a high Xu% may also be related to the subject's interpretation of the testing situation (Wiener, 1966), which may or may not be a broad sample of the subject's response style. Thus an elevation of egocentric and possibly creative responses may or may not indicate difficulties in adaptation to reality or ego functioning. Other factors may be helpful in determining the characteristics of a person with an elevated Xu% and will be discussed below.

An elevation of distorted responses (X-%) indicates difficulties with mediation of visual stimuli (Exner, 1986). Unlike Xu, smaller elevations of X- are thought to be more serious. Exner (1986) states that an X-% greater than 15% indicates considerable distortion and an X-% greater than 20% indicates a disabling distortion of stimuli (i.e., difficulty matching reality with one's own experiences).

The reliability of X-% across different groups is supported by several studies. Exner (1978) reported an unpublished study done by Exner and Wylie (1975) that found

11 of 12 second year graduate students in clinical psychology, who had reviewed Rorschach protocols of schizophrenics, were unable to "create" a schizophrenic protocol. Five of the 12 students' X+% remained within the average range (i.e., that is no lower than 70%). Six of the 12 students achieved an X+% less than 70% but, unlike a schizophrenic's protocol, Xu% was greater than X-%. In another study, Exner, Armbruster, and Mittman (1978) found X+% to remain consistent for different groups when asked to give as many responses as possible within 60 seconds. Adult non-patients and schizophrenics' X+% remained within their reported norms. In fact, when asked to choose the two best responses, adult non-patients primarily selected common percepts while schizophrenics primarily selected poor percepts. These studies suggest that it is difficult to fake perceptually schizophrenic-like perceptions.

In a somewhat more cautious interpretation of X-%, Weiner (1966) summarizes Korchin's belief that personal needs, organicity, impoverished experiences or the subject's interpretation of the testing situation can result in minus responses and these possibilities must be adequately assessed. Thus, an elevation of X-% greater than 15% is cause for further evaluation to assess if some sort of serious perceptual disability or other factors, such as the subject's interpretation of the testing situatin are effecting the subject.

In summary, according to Exner (1986) and others, a decrease in X+% below the normal limits (mean = 80, s.d. = 10), to approximately 70%, is cause for inspection of the person's perceptual accuracy. As noted above, it is important if the lower score is due to an elevation in responses of Xu, X-, or both. In other words, is it due to a commitment to unconventionality or to perceptual-mediational distortions?

Diagnostic Utility of Form Quality

Exner (1986), like Rorschach (1964), has found form quality to vary across different diagnostic groups. See Table 2.

In a factor analysis of all Rorschach variables, Mason, Cohen and Exner (1985) found X+% to load on a factor for three different groups (schizophrenia, depression, and nonpatients). Mason et al., (1985) interpreted the factor for depressives, in which X+% had a negative loading, as measuring affectivity and immaturity. In their findings, perceptual accuracy and self-esteem decreased as strong, unmodulated feelings increased. For nonpatients, X+% loaded negatively on a factor. Mason et al. (1985) thought this loading was related to the positive loading of the number of responses. That is, the greater the number of responses the more unusual and Dd responses were given, thus lowering X+%. Mason et al.(1985) interpretated the

Table 2. Normative Data for Schizophrenic, Character-problem, Depressive and Nonpatient Adult Groups for X+% and X-%.

	X+%			X-%		
	MEAN	SD	MODE	MEAN	SD	MODE
Sz	.53	.17	.50	.31	.15	.33
C-P	.70	.13	.75	.15	.09	0
Dep	.68	.12	.63.	.15	.10	.16
Npt	.80	.09	.86	.06	.05	.04

Normative values from Exner (1986), pp 288-294. Sz=schizophrenia; C-P=character-problems; Dep=depressives; Npt=Nonpatient adult.

factor for schizophrenics, in which X+% was positively loaded, as a measure of health. X+% increased along with measures of self-esteem, cognitive integration, and interpersonal awareness. In all of these groups, X+% is broadly related to autonomy or ego functioning. That is, the positive relationship of self-esteem and affective control with X+% in depressives; the negative relationship of X+% with original and stimuli limiting responses in normals; and the postivie relationship of X+% with self-esteem and abilit to relate to others in schizophrenia all suggest a relationship of increase in ego functioning and control over having needs met. In normals, especially, a greater frequency of responses is related to a greater expression of individuality and control of responses to stimuli. Form quality is considered to be an essential indicator for schizophrenia and makes up two of the five indicators (X+%<70 and either Sum FQ->Sum FQu or X-%>20) for Exner's (1986) Schizophrenia Index (SCZI). The other three indices on the SCZI are related to intactness of thought and interpersonal relationships. It is not uncommon to see two indices of form quality, X+%<70 and either Sum FQ->Sum FQu or X-%>20, positive in records of subjects with schizophrenia, reactive psychosis, severe affective disorders, neurological impairments, and some types of learning disability (Exner, 1986). Acklin (1989) found that children diagnosed as having a learning

disability have a significantly higher percentage of X-% than nondisabled children.

Thus, the variation of form quality across different categories of mental illness and learning disabilities, its consistent loading on the factors in a factor analysis of Rorschach variables for different categories of mental illness, and its importance in identifying schizophrenia supports the premise that form quality (i.e., the measure of perceptual accuracy) is a very important factor in classifying people.

To summarize, empirical data confirms the premise that form quality is a measure of the ability to accurately perceive reality or appropriately mediate associations between inner and outer stimuli. Accurate perception requires both an adequate amount of control over an intact mental apparatus as well as richness of experience. In short, it may represent ego functioning (Beck, 1948).

The range of form quality that characterizes perception is considered to be directly related to behavior. An optimum X+% (70 to 90%) indicates a preponderance of conventional behavior with a small amount of unconventional or disturbed behavior. A maximum of X+% indicates overly conventional behavior without any expression of individuality or overt behavioral digressions. A lowered frequency of X+% can indicate a commitment to individualistic tendencies that may or may

not impair everyday functioning. In short, a significantly lowered amount of X+% may indicate a weakness in one's ability to observe social rules and therefore a reduction in one's own self-respect (Beck, 1948), or self-integration (Exner, 1974), or a willingness to observe social rules which may or may not be related to self-respect and integration (Exner, 1986), or may only be a response to the testing situation (Weiner, 1966).

Although form quality has been found to be an essential and consistent element for inferring behavior and indicating mental health, it is not a sufficient predictor. Other variables are also necessary in further assessing behavioral characteristics indicated by the range of form quality.

Other Rorschach Measures and Predictions

Although form quality is important and central to interpretation, most Rorschach researchers and theoreticians agree that form quality does not tell us enough about the quality of thinking and behavior. Several other indices are important to the elaboration of quality of thought and behavior because different cognitive traits and varying degrees of organized psychological resources can affect behavior elicited by different stimuli. Other measures in Exner's (1986) Comprehensive System evaluate quality of thought and quality and quantity of coping

ability and are considered to be related to form quality. These measures of quality of thought and both quality and quantity of coping ability are believed to impact directly on behavior and combine with form quality to highlight, deemphasize or exacerbate characteristics indicated by form quality. Below is a summary of measures pertinent to form quality and the hypothesized direction of relatedness between each measure and form quality.

As mentioned above, a thought disorder is one important element to consider when interpreting the impact of form quality on behavior. Quality of thought contributes to assessing if a person's ability to organize and express his thinking is inhibiting his ability to accurately perceive and report conventional percepts. That is, problems in forming clear associations is expected to impede upon reporting good or conventional percepts and acting in appropriate ways. Disordered thinking is evaluated by several different elements in the Rorschach that make up the broad category called Special Scores. They include deviant verbalizations (DV), deviant responses (DR), incongruous combinations (INCOM), fabulized combinations (FABCOM), contaminations (CONTAM), inappropriate logic (ALOG), perseverations (PSV), and confabulations (CONFAB). These elements indicate mild to severe aberations in thinking (Exner, 1986), which when elevated in a protocol indicate difficulty in making clear

and conventional responses.

Deviant responses (Exner, 1986) are responses articulated in a strange manner. They contain verbiage that is circumstantial or inappropriate to the articulation of the percept. For example, a subject might report "It looks like a sad clown to me but I wanted to see a pretty cat". Deviant verbalizations are responses that contain the use of either a redundancy of terms or a neologism. For example, "A pair of two shoes". They both represent a difficulty getting the idea across, the latter (DV) is a minor communication error. DRs are frequently related to affective difficulties (Exner, 1986). An elevation of either or both of these special scores suggests difficulty in clearly expressing a percept and can result in unusual or distorted percepts.

INCOMs, FABCOMs, and CONTAMs compose a subgroup of inappropriate combinations. FABCOMS and CONTAMS are considered to be more severe than DR and DV (Exner, 1986). INCOMs are responses that merge together parts of the blot into an inappropriate whole object. For example, "A mouse with antlers." They indicate a failure to discriminate or adequately articulate what is seen and is the most frequently given special score (Exner, 1986). FABCOMs (Exner, 1986) are responses of two objects engaged in an action that is inappropriate to their category. An example of this is, "Two bears playing cards together." These

indicate irrational thinking and are associated with loose, inconsistent and disorganized thinking (Exner, 1986). CONTAMs (Exner, 1986) are responses that merge two separate objects into one percept. The response "A dog-fly" where the percept includes the body of a fly and the face of a dog superimposed on each other is an example of a CONTAM. This response represents the most "severe form of cognitive disorganization because of its fluid and strange reasoning qualities" (Exner, 1986). An elevation in frequency of any of these three special scores, especially CONTAMs, is expected to be negatively correlated with X+%.

Perseveration responses are those that either identify a percept as the identical object seen previously or use the exact same location, content, determinants, developmental quality, organizational value, and form quality as the preceding response, or are mechanical-like repetitions of an object across several cards (Exner, 1986). A CONFAB is a response that is void of any meaningful integration of parts of the blot in articulating the percept (Exner, 1986). For example, "A dog, there's his nose" and upon further inquiry the subject does not elaborate any further on what makes it look like a dog or where the dog is besides pointing to the nose. Both PSV and CONFAB suggest cognitive rigidity or impairment (organicity) when elevated in a protocol (Exner, 1986). With both PSV and CONFAB, rigidity of thought or an organic

impairment can result in a rejection of the contours of the blot. With an elevation of PSVs and CONFABs a decrease in X+% is predicted. Because PSV and CONFAB are not included in the weighted sum of six special scores (WSUM6), they will be tallied separately.

An ALOG is similar to, but less severe than the CONFAB. An ALOG is a response that uses size, location and/or number of elements included in the percept to explain the percept (Exner, 1986). For example, "The pink must be hell because it is at the bottom of the picture". As with PSVs and CONFABs, ALOGs can result in a rejection of the contours of the blot in offering a response. Thus ALOG is predicted to be negatively correlated to X+%.

Rather than tally all the special scores individually, a weighted sum of six special scores, WSUM6, (Exner 1986) will be correlated with form quality. Exner (1986) has applied a weighted value to each of the special scores to account for the severity in thinking indicative of each. Special scores that indicate greater disorganization of thought and thus occur less frequently in the nonpatient adult sample are weighted the greatest. Exner (1986) found the mean of WSUM6, which includes in order of least valued to most valued, DV, INCOM, DR, FABCOM, ALOG, and CONTAM, to vary among different clinical groups: inpatient schizophrenics have a mean of 16.88, depressives have a mean of 6.98, character disorders have a

mean of 6.52, and nonpatient adults have a mean of 3.96. According to Exner (1986) a WSUM6 greater than 11 in adult records indicates considerable disordered thinking (i.e., a thinking problem). In addition, Mason et al. (1985) found Special Scores and X+% to be negatively correlated (r = -.30). Thus, WSUM6 is predicted to be negatively correlated with X+% and positively correlated with either X-% or Xu%. However, as X-% soars beyond 20% then it is predicted that WSUM6 will be more strongly correlated to X-% than Xu%. This prediction is based on Exner's (1986) SCZI which includes X-% > Xu% or X-% > 20% as one of its five factors and the premise that X-% > 20% indicates a severe impairment in reality testing. Thus, as the indication of a thought disorder becomes greatly elevated so will the frequency of poor percepts.

The amount of tolerance to stress that a person has is another important variable related to form quality. Individuals under a great deal of stress are more vulnerable to making errors in perception than those who are not as stressed. Exner's (1986) Comprehensive System assesses stress tolerance (D) by subtracting the amount of stimulus demands (es) from the amount of psychological resources (EA) that are available to the individual (D = EA-es). The higher the score the greater the amount of tolerance to stress because of one's ability to organize psychological resources. Weiner-Levy and Exner (1981)

concluded that the stress tolerance ratio is more a measure of the "potential limitations to cognitive processing-mediational operations" (p. 123) than an index of tolerance to frustration. This is consonant with Exner's (1986) statement that a low stress tolerance ratio (-2 and below) indicates that the person is overwhelmed by demands and demonstrates frequent inappropriate or insufficient behaviors in response to continuous stimulus overload. Thus, it is plausible to expect that the frequency of good form quality will be more depressed for people under a great deal of stress relative to those not overstressed.

Another helpful indicator in explaining a low good form quality (X+%) is a measure of coping style, Lambda. Lambda is the percentage of pure-form responses relative to the total number of responses given (total number of pure-form responses/total number of responses minus the total number of pure-form responses) (Exner, 1986). Exner (1986) states that a high Lambda suggests either an inhibited (coarcted) cognitive style when more than 14 responses are given, or a lack of involvement in the test depending on frequency of popular responses and X+%. Exner, Viglione and Gillespie (1984) found Lambda to have a low correlation with X+% and thus the two are considered to be independent of each other. However, this low correlation may be due to the curvilinear relationship between Lambda and X+% suggested by data and theory. More will be said about this

below.

Exner (1986) concluded that a high frequency of pure form in a record of at least average length, indicates a stylistic inhibition of stimulating perceptions or an oversimplification of stimuli which can result in difficulties with others. Thus, although X+% and Lambda have been found to be independent, individuals with schizophrenia and character problems have been found to have an elevated Lambda. Given the nature of schizophrenia and character problems (i.e., interpersonal problems) and possibly inhibited responses, it is predicted that subjects with an elevated Lambda will have an elevated Xu% and/or X-%.

A lower than average Lambda suggests three different interpretations: 1) overinvolvment with the task, 2) need for achievement, and 3) need to be correct (Exner, 1986). If the low Lambda is due to the subject's overinvolvement in the stimulus then depending on his strength of assimilation and the use of other cognitive abilities, such as creativity, then an elevation in X-% or Xu% may or may not be evident. However, with a subject feeling challenged by the test and abandoning all economy to meet the challenge an elevation in Xu% or X-% would be plausible because of the greater expression of the person through his responses. In contrast, a person with a strong need to be correct would be expected to be well within the means of

all levels of form quality with a possible higher X+% and popular responses (Exner, 1986).

Thus, given the data and premises offered for Lambda and its relationship with X+%, a unidirectional correlation of Lambda and X+% is not suggested. When Lambda is treated as having a linear function then it will be independent of X+%. However, by combining both high and low Lambda scores together so that they represent a singular value separate from moderate Lambda scores a negative correlation between Lambda and X+% and a postive correlation between Lambda and either Xu% and X-% are predicted.

Popular responses, as mentioned above, are also important indicators of personality. They are responses that occur once in every three protocols. Exner (1986) states that a low frequency of popular responses, four or less, indicates either an unwillingness or an inability to report the most common percepts.

Empirically, the frequency of popular responses has been found to be reliable and independent of X+%. Exner et al. (1984) found popular responses to be independent of form quality. The correlation between popular responses and X+% was nonsignificant (r = -.02). Exner (1986) found popular responses to have a high test-retest reliability, .84 to .88 for short-term and .79 to .86 for long-term intervals and that the frequency of popular responses between different groups vary. Popular responses are

related to cognitive style and personality. For example, reporting only a few popular percepts suggests an uneconomical cognitive style and unconventional personality. Popular responses are predicted to be negatively correlated with Xu% or X-% and positively correlated with X+%. As Popular responses go down, subjects report fewer conventional responses and possibly report more unusual or distorted responses.

Cognitive style as measured by the frequency of rarely used areas of the blot (Dd) is an important indicator to consider when evaluating the impact of form quality on a person's personality. Dd responses represent a narrowing of the stimulus field to a manageable and acceptable size. An elevated Dd, greater that three, suggests several different cognitive styles: a) uncommon and typically obsessive or perfectionistic style; b) an oppositional style and/or striving for autonomy; or c) a need to limit the world to manageable units (i.e., avoidance of stimuli) (Exner, 1986). Kadinsky's (1952, see Exner, 1986) conclusion that an elevation in Dd responses is indicative of a good internal adjustment but a poor external adjustment, suggests that as Dd increases, X+% decreases due to less adaptability to reality. This premise is consistent with Mason et al. (1985) who found Dd to be negatively correlated to X+% ($\underline{r}$ = -.40) with the number of responses (R) partialled out, and Exner et al.'s

(1984) finding that Dd is negatively correlated to X+% on a factor for nonpatient adults. Exner (1986) generically interprets this to mean that as the number of responses goes up, a person is more likely to give uncommon responses which is related to an increase in Dd located responses and a decrease in X+%. Thus, Dd has been found to be negatively correlated with X+% and is postulated to be related to one of three possible cognitive styles that encourage the use of rare or unusual combinations of stimuli to produce a response. In keeping with these findings and premises, Dd is predicted to be negatively correlated with X+% and positively correlated with Xu% or X-%.

The organizational efficiency (Zd) of a person, as measured in Exner's (1986) Comprehensive System, is another indicator that can help explain a low frequency of good form quality. It is a measure of the amount of effort put into organizing and integrating elements of the blot into a meaningful relationship. The greater the differentiation and relatedness of elements within the blot a person makes, relative to the difficulty of the blot itself, the greater the Zd. It is calculated by taking the estimated sum of points per number of successful organizations and subtracting from it the actual sum of points received in the protocol (Exner, 1986).

Exner (1986) has developed a scoring system for Zd that indicates type of incorporation of stimuli. A Zd equal to or greater than three is considered by Exner (1986) to indicate a great expenditure of effort in differentiating and integrating the stimulus and is called overincorpora-tive. A Zd equal to or less than -3 indicates a paucity of organizing effort. This is described by Exner (1986) as underincorporation and suggests a neglect of the stimulus when processing a response. With stimulus neglect is the strong possibility of poor or unusual form quality. Thus, Zd is predicted to be positively related to X+% and negatively related to Xu% and/or X-%.

X+% may also be related to the amount of self-involvement. Subject's with high self-involvement may give more unusual responses than those not as self-involved and thus result in a lower X+%. Exner's (1986) Egocentricity Index, EI, is a ratio of weighted reflection responses and pair responses over the total number of responses and is thought to measure self-involvement. Statistically, EIs relationship with X+% is equivocal. Exner et al. (1984) found it to be independent of X+% ($\underline{r}$ = .09), but Mason et al. (1985) found it to be mildly correlated with X+% ($\underline{r}$ = .21). Exner (1986) states that an elevation of self-concern may reduce the amount or quality of involvement with others. Given the hypothesized egocentric quality of

responses that include pairs and reflections and the equivocal data concerning its relationship to X+%, an increase elevation of Xu% is predicted to be positively correlated with an elevation in EI.

An increase in the frequency of Xu, at the expense of conventional responses may also be related to strivings for autonomy. The use of white space in a response (S), either as the primary determinant of a percept, in the sense of a figure-ground reversal, or as a secondary determinant, such as using spaces as eyes, has been hypothesized to indicate neurotic and oppositional traits (Exner, 1986 and Rorschach, 1964) and the autonomous strivings of the ego (Fonda, 1977). Fonda (1977) concluded from his own work and review of the literature that empirical work does not support the pejorative interpretation of S responses as representing purely oppositional and negativistic behaviors. He states that research suggests a relationship of S responses to field-independence and can be interpreted as representing ego strivings for mastery and autonomy. He also suggests that Rorschach's (1964) speculation on S responses logically supports his hypothesis. That is, Rorschach's description of an oppositional tendency that is manifested differently depending upon one's experience type (Erlebnestypus) implies a system of ego and elements opposite or contrary to it. Exner (1986) supports the autonomous strivings

component of S responses in his interpretation of an elevation of S responses as being stimulated by a strong and long-term experience of dissatisfaction that is expressed through oppositional and negativistic responses. In other words, in subjects with elevated S responses the dissatisfaction is related to an inability to have one's needs met and is an attempt to assert oneself in a hostile or aggressive way when autonomy is threatened. In addition, to strengthen the trait hypothesis, Exner (1986) found a high test-retest reliability (.86) for subjects, regardless of membership in other groups, who gave S responses by using the whole blot, and/or a common area plus the most infrequent areas. Subjects who gave S responses only on the first two cards had a low test-retest reliability ($\underline{r}$ = .36) and suggests a situational phenomena (Exner, 1986).

Using Exner's (1974) position that the oppositional tendency can easily effect reality testing and become nonadaptive or destructive and balancing this prediction with Fonda's (1977) theory of autonomy strivings, it is posited that elevated S responses can result in a reduction in X+% and an increase in Xu% or X-%. A person with an elevated S would tend to give more uncommon responses. In addition, given Exner's system of scoring minus form quality, some S responses may include a gestalt operation of closing off the blot with an imaginary line and thus result in an increase in Xu% or X-%.

A large number of Rorschach variables have been discussed in relation to form quality. A brief summary of the variables and their predicted relationship to form quality is provided so as to maintain a focus on what will be examined.

1) WSUM6 and PSV and CONFAB suggest, loose thinking, a thought disorder or an organic disorder. A moderate to severe thought disorder or organic dysfunction can noticably impact on the ability to organize and then meaningfully associate stimuli with engrams and censor the reporting of associations. Thus a thought disorder can impair the mediational elements of perception. WSUM6, PSV and CONFAB are predicted to be negatively correlated with X+%, which is consistent with Mason et al.'s (1985) findings, and positively correlated with X-% and/or Xu%.

2) Stress tolerance (D) is an indicator of the amount of psychological resources organized to deliberately direct behavior in a meaningful way and implies ego strength. A low D is thought to be related to difficulty in producing sufficient and appropriate behaviors (Exner, 1986). Thus D is predicted to be negatively related to X+% and positively related to X-% and/or Xu%.

3) Lambda is an indication of cognitive style. A high Lambda suggests an inhibited or oversimplified response style while a low Lambda suggests an overinvolved response style. Either of these styles may result in an

elevation in X-% and/or Xu%. Thus, a high or low Lambda is predicted to be negatively correlated to X+% and positively correlated to X-% and/or Xu%.

4) The popular response is another measure of cognitive style as well as economy. The frequency of popular responses reflects the willingness and/or ability to report the most common percepts. Although populars have been found to be independent of X+% (Exner et al., 1984), the implied cognitive economy of reporting popular responses suggests that a low frequency of popular responses may be related to unconventional or distorted responses. Thus, popular responses are predicted to be negatively related to X-% and/or Xu% and positively related to X+%.

5) The limiting of stimuli and/or utilizing uncommon areas of the blot (Dd) is another cognitive style that results in an elevation of unconventional and distorted percepts. This cognitive style may be related to autonomous strivings of the ego. Dd is predicted to be positively correlated with Xu% and X-%, and negatively related to X+%.

6) Organizational efficiency (Zd) can range from being very high to very low and indicates the amount of integration of the stimuli in each blot. A low organizational efficiency reflects a lack of thorough or involved organization of the stimuli and suggests

oversimplification or distortion of stimuli mediation. Thus, Zd is predicted to be positively correlated with X+% and negatively correlated with X-% and Xu%.

7) A high degree of self-involvement, as measured by EI, suggests a lack of investment in conventionality. Thus EI is predicted to be negatively related with X+% and positively related to Xu% and X-%.

8) Finally, high autonomous strivings (Fonda, 1977), as measured by S responses, suggest a trait-like need to assert oneself, possibly in an oppositional or aggressive manner (Exner, 1986), rather than act in a conventional manner. Thus, the frequency of S responses is predicted to be negatively correlated with X+% and positively correlated with Xu% and X-%.

As discussed throughout the text, many different variables can interact to produce complex descriptions of personality and behavior. A complex cluster of variables may be found to be related to lowered X+% and elevated X-% and/or Xu%. Thus, all the variables discussed above will be clustered together to see how well they predict X+%, X-%, and Xu%.

The above discussion on form quality as measured by the Rorschach (Beck, 1948; Exner, 1986; and Rorschach, 1964) has shown that form quality reflects perceptual-mediational ability and style. Different groups of people can be broadly categorized into groups of varying degrees

of behavioral appropriateness (i.e., conventional behavior) using X+% and finer classification can be made by including Xu% and X-% with X+%. The previously mentioned example of a person with a low X+% (60%) and high X-% (25%) and a person with a low X+% (60%) and a high Xu% (30%) will help to re-illustrate the interdependence of Rorschach variables when making an interpretation. According to Exner's (1986) frequency tables the low X+% is frequently seen in records of schizophrenics, depressives, and character disorders, and other research (Acklin, 1989) has found subjects with learning disabilities to also be included in this group. Exner (1986) states that such a low score indicates a low frequency of conventional responses. The elevated X-% is frequently seen in schizophrenics, and subjects with learning disabilities and suggests (Exner, 1986) a very high frequency of distorted responses which impair interactions with others. If a thought disorder accompanied this score of a low X+% and a high X-% then it would further suggest schizophrenia and a severe impairment in interactions with others (Exner, 1986). On the other hand, subjects with a learning disability might not manifest other difficulties and have a moderate impairment in interactions with others and mediating stimuli because of an ability to compensate for their disability. Such examples of specific differences between groups using form quality and complimentary variables are numerous.

Concurrent Validity with the Minnesota Multiphasic Personality Inventory (MMPI)

Form quality is considered to be an essential variable (Beck, 1948; Exner, 1986; and Rorschach, 1964) in the initial classification and description of subjects. The above mentioned behavioral correlates of X+%, X-%, and Xu% (Beck, 1948; and Exner, 1986) overlap with behavioral correlates and classifications on the Minnesota Multiphasic Personality Inventory (MMPI). In this section I will discuss MMPI validity and clinical scales that are relevant to the discussion of form quality on the Rorschach and relevant research on relationships between the Rorschach and MMPI.

The MMPI is used to diagnose patients into several different clinical categories. Nine of the ten clinical scales have been created through an empirical analysis of the responses given by the targeted group in contrast to a normative sample (Greene, 1980).

One scale used as a variable is Psychopathic Deviant (Scale 4). Greene (1980) interprets an elevated Scale 4 to indicate a person who is "socially nonconforming, disregarding social rules and conventions in general and authority figures in particular " (p. 86). This description parallels Exner's (1986) description of an individual who has a depressed X+% and an elevated Xu%. An elevation in Scale 4 for normal persons indicates traits similar to psychopathic deviants. They are "rebellious,

immature, exhibitionistic, unconventional and nonconforming" (Greene, 1980, p. 86). Although socially deviant, they do not display common psychopathic behavior (Greene, 1980). Close to 10% of college students have a T-score above 70 (clinically significant) on Scale 4 (Greene, 1980). However, these students with a clinically elevated profile and who seek campus counseling have been found to have had legal and academic problems. Greene (1980) also reports that social activists, mental health professionals, and adolescents tend to have high Scale 4 scores. Thus, these people would be expected to have an elevated Xu%.

Greene (1980) reports test-retest reliabilities for the short-term to be in the .59 to .84 range and in the .49 to .61 range for the long-term. Thus, this scale is moderately stable over time and can represent trait-like behaviors depending on the issues related to an elevated score. A Scale 4 given its parallel with form quality, specifically Xu, on the Rorschach is a good measure to use to assess concurrent validity.

Thus, Scale 4 broadly covers conventionality and rebelliousness. Low scores indicate very conventional behaviors and little sense of rebelliousness. Moderate scores indicate some sort of ongoing conflict. Markedly elevated scores (T-score > 70) suggest a great deal of rebelliousness and unconventionality. Such behavior reflects a sense of irresponsibility, egocentricity and

immaturity (Greene, 1980). High scorers also tend to have a "perfectionistic self-concept", (Greene, 1980, p. 87).

Several other clinical scales are used to classify patients into categories that parallel the behavioral and diagnostic predictions offered by specific scores on the Rorschach, especially form quality. They are, Schizophrenia (Scale 8), Social Introversion (Scale 8), and the validity scales F (level of distress willing to report) and K (social desirability).

The Schizophrenia scale (Scale 8) not only classifies people as psychotic but, depending on the score and status of the subject (psychiatric or normal), indicates other behaviors as well that are related to Rorschach scores. The primary diagnosis of psychosis, due to an elevated T-score ($T > 70$), is related to characteristics similar to a depressed X+%, elevated X-%, elevated Special Scores, and poor interpersonal scores on the Rorschach. The Scale 8 items include "bizarre thought processes and peculiar perceptions,...and disturbing questions of self-worth and self-identity," (Greene, 1980, p. 102). Extremely high scores (T-score > 100) suggest an acute psychotic reaction rather than schizophrenia, (Greene, 1980). Greene (1980) describes normal subjects who score extremely high on Scale 8 as similar to those in the psychiatric sample. Moderately high scorers who are normal, (T-score between 60-75), are described as "self-

dissatisfied, irritable, having wide interests, and immature...(and) likely to be perceived as being deviant or withdrawn ...creative, individualistic, and imaginative." (Greene, 1980, p. 106).

Thus, a person with psychicatric problems or a person experiencing a great deal of stress and an elevated Scale 8 would be expected to have a depressed X+%, elevated X-%, and a high number of special scores due to a report of very high distress and bizarre experiences and thoughts. Normal subjects with an elevated Scale 8 would still be expected to have a depressed X+%, but have an elevated Xu% due to the greater amount of reported deviant experiences and greater potential of creativity, immaturity, individuality, and wide range of experiences. Thus, X+% is predicted to be negatively correlated with Scale 8 and Xu% and X-% are expected to be positively correlated with Scale 8.

Social Introversion (Scale 0) on the MMPI indicates relatedness to others. An elevated score (T-score > 70) suggests an "introverted, shy and socially insecure" (p. 113) person who tends to withdraw from others (Greene, 1980). A person with an elevated X-% would tend to report less connections to others because of difficulty adapting to reality. A person with an elevated Xu% may be more self-involved than others and thus reach out to others less. Thus X-% and Xu% are predicted to be positively

correlated with Scale 0.

The F scale on the MMPI indicates the amount of distress a person is experiencing and willing to report. The scale has items that include "bizarre sensations, strange thoughts, peculiar experiences, feelings of isolation and alienation..."(Greene, 1980, p. 37). Low to average scores on this scale suggests a sense of conventionality and a few unusual experiences. A moderate score (T-score 60-69) suggests the person is experiencing an elevated amount of distress or unusual experiences and may or may be not adapted to the distress. An extreme score (T-score 70 and above) suggests either a person experiencing a great deal of distress or malingering. Greene (1980) notes that adolescents going through an identity crisis report such scores as do psychotic individuals. Thus, an elevated score on the F scale in the MMPI could translate into an elevation of unusual (Xu%) and distorted (X-%) perceptions as well as other indices on the Rorschach that can accompany such perceptions. F is predicted to have a positive correlation with X-% and/or Xu%. The K scale on the MMPI has been interpreted as a measure of personality integration and healthy adjustment or defensiveness depending on the mental health status of the subject (Greene, 1980). Exner, McDowell, Pabst, Stuckman, and Kirk (1963) described it as an indicator of social desirability in intelligent and healthy subjects.

Exner, Armbruster, and Mittman (1978) split three groups of subjects (schizophrenics, depressives, nonpatient adult) on the median of the T-score for K and found that those nonpatient adults and depressives with a higher K score tended to give more popular responses than low K subjects. Thus, those subjects with an elevated K score would have a higher X+% and lower Xu% and possibly X-% than those with a lower K score because of a defensiveness and sophistication to not report strange or unusual experiences. K is expected to have a negative correlation with X-% and/or Xu%.

Rosen (1952) tested the hypothesis that elevated space responses (S) indicate oppositional, negativistic behavior by comparing S response frequency on the Rorschach to elevation of clinical scales on the MMPI, especially Scale 4. Rosen (1952) attempted to replicate Boss' (1931, cited in Rosen) finding that psychopathic deviates, as diagnosed by the MMPI and the Rorschach, had an elevated number of S responses, and to assess the premise that S responses represent oppositional behavior. Rosen (1952) selected 109 subjects from a sample of both inpatients and outpatients at a psychiatric hospital who had valid MMPI and Rorschach protocols.

A Chi squared analysis of the relation of S to Scale 4 was nonsignificant for psychopathic patients in either direction and significant for two different breakdowns of

the non-psychopathic sample. No significant relationship was found between S responses and Paranoia (Scale 6), Depression (Scale 2) or Psychasthenia (Scale 7). Rosen (1952) concluded that S responses are related to contrariness as measured by Scale 4 on the MMPI.

Rosen also found Scale 4 on the MMPI to be related to the following cluster of Rorschach measures: R, S, Sum C, extratensivenss, and dilation (Sum C and M greater than three). He speculated that this represents a tendency to respond to stimuli in an extraverted and impulsive manner and to not be constrained by the superego (Rosen, 1952). He defined oppositionalism as a tendency respond to stimuli with a non-conforming attitude. (Rosen, 1952). Unfortunately, measures of form quality, popular responses, organizational efficiency, stress tolerance, egocentricity and Dd responses were not included in Rosen's study.

Several clinical and validity scales (4, 8, 0, F and K) on the MMPI suggest behavioral correlates similar to those suggested by form quality as measured on Exner's Comprehensive Rorschach System (1986). Rosen's (1952) research supports the position that Scale 4 does overlap with several Rorschach variables related to "non-conforming attitudes". Exner et al.(1978) found that K on the MMPI is a good predictor of level of conventionality or social desirability as measured by X+% and P on the Rorschach. Given the suggested and empirically established

relationships between the Rorschach and MMPI, the following predictions are put forth:

1) Scale 4, which measures the degree of awareness and accordance to conventionality, is predicted to be positively related to Xu% and X-% and negatively related to X+% on the Rorschach. As Scale 4 becomes elevated it indicates a greater degree of oppositionality or rejection of conventional behavior which is similar to an elevation in Xu%.

2) Scale 8, which measures quality of thought processes and perceptions, is predicted to be positively correlated with X-% and/or Xu% and negatively correlated with X+%. As Scale 8 becomes elevated it indicates more creative and/or bizarre thinking. Such expressions are similar to elevations in X-% and Xu%.

3) Scale 0, which indicates quality and quantity of relatedness to others is predicted to be positively correlated with Xu% and/or X-% and negatively correlated with X+%. An elevation of Scale 0 suggests a greater degree of withdrawal from others. This may be related to a greater self-involvement and/or severe difficulties in interpersonal relationships.

4) Scale F, which indicates the amount of distress a person is willing to report, is predicted to be positively related to Xu% and/or X-% and negatively correlated with X+%. An elevation in Scale F suggests a great amount of

distress which may accompany an increase in Xu% and/or X-%.

5) Scale K, which is measure of social desirability, is predicted to be negatively correlated with Xu% and/or X-%. A lowered K score suggests either a lack of concern for social convention or a lack of sophistication and is similar to either an elevated Xu% and/or X-%.

Summary

Rorschach systematizers postulate that a personality profile can be inferred from a structural analysis of responses given to the inkblots. Exner (1986) argues that direct behavioral inferences can be made from structural analysis of a protocol with a voluminous amount of descriptive and correlative data to support his theory. An essential indicator in many Rorschach systems' structural analysis is the measure of form quality. Level of form quality has been described as an indicator of the intelligence, flexibility and richness of a person's experience (Rorschach, 1964), of ego functioning (Beck,1948) and of type of behavior- conventional, unconventional or eccentric, and impaired (Exner, 1986). Common to all of these definitions associated to form quality is the idea of the control of ideational processes relative to society. All three of the mentioned systematizers utilize a primarily consensual system to measure form quality.

Given this premise of the appropriateness of selection of ideations relative to society, and especially Exner's (1986) direct inference to quality of behavior, it is important to verify the predictability of this measure both in relation to other measures and the description of certain personality types. As described above, other Rorschach indicators are necessary to build personality types from different foundations of perceptual accuracy. Indicators that are important to describing personality styles and associated with levels of form quality include the following: a) quality of thinking as measured by Special Scores; b) guarded coping style as measured by Lambda; c) oppositionality as measured by Space responses; d) stress tolerance as measured by EA - es; e) amount of processing of the stimulus as measured by Zd; f) use of infrequent areas of the blot as measured by Dd; g) degree of self-involvement(EI); and h) ability and willingness to report conventional responses as measured by Popular responses. Measures on the MMPI, as described above, that describe behaviors and personality types similar to those described both by levels of form quality and clusters of different measures are the following: a) Pschopathic Deviant (Scale 4), b) Schizophrenia (Scale 8), c) Social Intorversion (Scale 0), and d) the validity scales of F (distress) and K (social desirability or sophistication).

METHOD

Subjects. Examinees were 268 students enrolled in undergraduate psychology courses at a Private Midwest Jesuit University students who were tested in a graduate personality assessment course and received course credit. Subjects were informed of the five or more hour committment and that a battery of psychological tests would be administered without any feedback given when the testing was completed. The mean age of the sample were 19.06, with a range of 17 to 32 years old and the mode 18. There were 173 females and 95 males. 62% of the sample were Caucasion, 22% were minority (i.e., African-American, Hispanic, Asian and other) and 16% were unreported.

Materials. Test materials included the Rorschach Psychodiagnostic, Exner's (1986) Comprehensive System for scoring the Rorschach, and the MMPI Form R (1985). Subjects were tested in offices assigned to the clinical graduate students who were enrolled in the personality assessment course.

Procedure. Testing was done over a two day period and typcially took six to seven hours. First year clinical graduate students participating in a two semester sequence

course in personality assessment administered a full battery of psychological tests, ranging from an intelligence test to projective drawings. The clinical students received in-class training on the Exner (1986) Comprehensive System, with further training that included using Exner's Workbook (1985) and weekly workshops taught by an advanced clinical graduate student who had already passed the course.

All test data were checked and rescored if necessary by the advanced clinical graduate student who assisted in teaching the course. An advanced clinical student, with an initial overall inter-rater reliability of .87 (using the scoring examples at the end of Exner's Workbook as a criterion to compare to) rescored a random selection of 20 Rorschach protocols from the whole sample of 268 Rorschach protocols. The advanced clinical student had an overall inter-rater reliability of .83. Special Scores were found to have a low inter-rater reliability (r = .57) and were rescored by a second rater who had an initial overall inter-rater reliability of .80 (using the scoring examples at the end of Exner's Workbook as a criterion to compare to). The MMPI data were checked initially by the teaching assistants and were not rescored for this study.

Analyses. A comparison of Rorschach variables from this sample of volunteer college students with Exner's (1986)

nonpatient adult sample was made using two-tailed t-tests. The Rorschach variables that were compared are the following: X+%, X-%, WSUM6, PSV, CONFAB, S, P, L, Dd, Stress tolerance (D), R, Zd, and EI.

To measure the relationship of X-%, X+% and Xu% with the above mentioned Rorschach variables, Pearson product-moment partial correlations, partialing out the overall total number of responses (R) were computed. Because of the interdependent relationship of number of responses with other Rorschach measures (Exner et al., 1984), the number of responses was partialed out of the Rorschach variables in all analyses comparing Rorschach variables between themselves. To control the alpha error rate, the sample was split in half and only results that were consistent for both groups at $p<.1$ were considered significant. Results that are consistent for both groups are considered to be cross-validated within the sample.

To assess the best combination of Rorschach variables in predicting form quality: X-%, X+% and Xu% several Multiple Regression Analyses (MRA) were computed. A SPSSX MRA FORWARD (PIN=.1) computer program was used. The X-%, X+% and Xu% measure weres predicted by WSUMSIX, PSV, CONFAB, D (stress tolerance), S, L, Zd, Dd, EI, and P. R was partialed out of the Rorschach variables in all analyses comparing Rorschach variables between themselves by adding R into the MRA equation on the first step.

The relationship of X-%, X+% and Xu% with MMPI scales was assessed with Pearson Product-Moment correlations. The X-%, X+% and Xu% scores were predicted by the MMPI Scales 4, 8, 0, F, and K.

The best combination of MMPI scales in predicting form quality: X-%, X+% and Xu%, was evaluated with several Multiple Regression Analyses (MRA). A SPSSX MRA FORWARD (PIN=.1) computer program was used. The X-%, X+% and Xu% measures were predicted by the MMPI Scales 4, 8, 0, F, and K.

RESULTS

Comparison of Sample and Normative (Exner, 1986) Frequencies for Select Rorschach Variables

The sample of 268 subjects was split in half according to identification numbers, odd and even. The similarity of the two samples on the variables measured was assessed by 14 *t*-tests. The number of responses between groups differed significantly, $t(1, 263) = -2.58$, $p < .01$. The mean number of responses for Group 1 was less than that of Group 2 (mean = 20.76 and mean = 23.493, respectively). No other significant differences between groups were found.

Given the similarity of samples on all variables except the total number of responses given per test, the two samples were pooled together and then compared to Exner's (1986) frequencies given in his normative table of 600 nonpatient adults. All of the Rorschach variables included in this study were studied with 12 *t*-tests, using the Satterthwaite correction for degrees of freedom (Winer, 1971). Satterthwaite's formula using separate variance estimates was used because of the large differences in sample size and variances between the University sample and Exner's sample. The Xu% was excluded from the comparison because it is not included in the frequencies tables for the normative sample and CONFAB was excluded because its standard deviation was absent from the frequency table

(Exner, 1986). The groups differed significantly on 11 of the 12 pairs compared: X+%, X-%, S, P, Dd, L, D WSUMSIX, PSV, EI, and Zd. There was no significant difference between R. See Table 3. The purpose of this comparison was soley descriptive. No predictions on similarities between the college sample and Exner's nonpatient sample were made. However, the large number of differences does require comment. These differences will be further considered in the Discussion section.

Correlations and Multiple Regression Analyses (MRA) of Rorschach Variables with Form Quality

Pearson product-moment partial correlations, controlling for R, were computed on all the above mentioned Rorschach variables to assess the relationships of each variable with form quality. One-tailed tests for significance were used since the direction of correlations was predicted. The partial correlations were computed on two separate samples that were drawn from the original sample as described above. The results from the two samples serve as a cross-validation of any significant results. Thus, results that are significant at the $p < .1$ level for both samples will be considered consistent and important to the population of volunteer college students represented by this sample.

Six MRAs using X+%, Xu%, and X-% as the dependent variables and the total number of responses (R), S, P, Zd,

Table 3. Summary of Means and Standard Deviations of the University Sample and Exner's (1986) Adult Nonpatient Sample for the Following Rorschach Variables: R, X+%, X-%, S, Dd, D, EI, WSUMSIX, PSV, CONFAB, P, L, Zd.

	University(N=265)		Exner(N=600)		
Variable	Mean	S.D.	Mean	S.D.	
R	22.14	8.69	22.57	5.54	ns
X+%	.50	.14	.80	.09	*
X-%	.20	.12	.06	.05	*
S	3.33	2.31	1.84	1.66	*
Dd	3.51	3.56	1.73	2.74	*
D	-.60	2.55	.02	1.83	*
EI	.43	.18	.39	.11	*
WSUMSIX	6.73	8.39	3.96	1.76	*
PSV	.26	.6	.05	.22	*
P	5.38	1.76	6.66	1.66	*
L	.69	.06	.59	.28	*
Zd	.02	4.93	.84	3.11	**

Note. * = $p < .002$ using a two-tailed t-test with separate variance.
** = $p < .001$ using a two-tailed t-test with separate variance.

Dd, L, D (stress tolerance), WSUMSIX, EI, PSV and CONFAB as predictor variables were computed using an MRA Forward (PIN = .1) computer program. An MRA was used to find the best linear combination of predictors of form quality. As determined above, the amount of variance accounted for by R was partialed out of the equation by separately entering it into the equation on the first step. Two MRAs were computed for each dependent variable using the two separate samples identified above.

Partial correlations, with R partialed out, found that, as predicted, P is significantly correlated to X-% in both samples, partial-r (128) = -.26, p = .001 and partial-r (131) = -.21, p = .007, respectively. No other Rorschach variables were significantly correlated with X-% in both samples.

The results of an MRA using X-% as the dependent variable for both samples are listed in Table 4. R is not significantly related to X-% in either sample. P was entered on the second step of the equation for both samples, Beta = .009, R = .27, F(2, 128) = 4.9, p = .009 and Beta = -.21, R = .21 F = 3.0, p =.05, respectively. Together R and P account for 7 and .4% of the variance, respectively, for each of the two groups. Two other variables, WSUMSIX and EI, were entered into the equation but only for Group 1. Because these other two variables were not significantly predictive in the linear model for

Table 4. Summary Table of MRA with X-% as the Criterion Variable and the Rorschach Variables of R, S, Dd, EI, P, D, Zd, L, PSV, CONFAB, WSUMSIX as Predictor Variables for Groups 1 and 2 from the University Sample.

		X-%		
Group 1				
Step	Variable	R	Beta	p
1	R	.05	.05	.56
2	P	.27	-.28	.009
3	WSUMSIX	.34	.21	.001
4	EI	.37	-.16	.001
Group 2				
Step	Variable	R	Beta	p
1	R	.046	.05	.60
2	P	.21	-.21	.05

Group 2, these variables yielded inconsistent findings. One possible reason why WSUMSIX was entered in Group 1 only is that the variance between samples for WSUMSIX was significantly different, $F(1, 263) = 1.60$, $p = .007$, with Group 1 having a smaller variance than Group 2. No other predicted relationships between X-% and other Rorschach variables were confirmed.

Partial correlations of X+% with other Rorschach variables, partialing out R, confirm some of the predictions. S is significantly correlated to X+% in both samples, partial-r (128) = -.29, $p = <.001$ and partial-r (131) = -.25, $p = .002$, respectively. Dd was significantly correlated to X+% in both samples, partial-r (128) = -.12, $p = .09$ and partial-r (131) = -.25, $p = .002$, respectively. In addition, P was positively correlated with X+%, as predicted, partial-r (128) = .23, $p = .004$ and partial-r (131) = .23, $p = .003$, respectively. Contrary to what was predicted Zd was negatively correlated with X+%. A two-tailed test of significance was computed and found partial-r (128) = - .28, $p = .001$ and partial-r (131) = -.17, $p = .05$, respectively. No other correlations with R partialed out were consistently significant with X+%.

The results of the MRA using X+% as the dependent variable for both samples are listed in Table 5. As predicted R was significantly correlated in a negative direction to X+%, Beta = -.36, $F(1, 129) = 19.09$ $p = <.001$,

Table 5. Summary Table of MRA with X+% as the Criterion Variable and the Rorschach Variables of R, S, Dd, EI, P, D, Zd, L, PSV, CONFAB, WSUMSIX as the Predictor Variables for Groups 1 and 2 from the University Sample.

		X+%		
Group 1				
Step	Variable	R	Beta	p
1	R	.36	-.36	< .001
2	S	.45	.30	< .001
3	WSUMSIX	.49	-.22	< .001
4	P	.54	.23	< .001
5	EI	.56	.16	< .001
6	Dd	.58	-.19	< .001
Group 2				
Step	Variable	R	Beta	p
1	R	.20	-.20	.019
2	Dd	.31	-.31	.001
3	S	.36	.22	< .001
4	D	.39	.17	< .001

and Beta = -.20, F(1, 131) = 5.6, p =.019, respectively. R accounts for 13 and 4% of the variance. S was entered on the second step of the equation for Group 1 and on the fifth step for Group 2. Dd was also entered into the equation for both samples but on different steps. In Group 1 it was entered on the last step and on the second step for Group 2. The other variables entered into one or the other equations for each sample will not be mentioned because they are considered to be inconsistent. However, they are listed in the table.

Partial correlations of Xu% with other select Rorschach variables, partialing out R, confirm one of the predictions and found a significant correlation in a direction opposite the prediction. Dd is significantly correlated in the positive direction to Xu%, as predicted, in both samples, partial-r (128) = .20, p = .01 and partial-r (131) = .15, p = .05, respectively. Zd's significant positive correlation with Xu% in both samples runs contrary to the prediction. A two-tailed test of significance found partial-r (128) = .22, p = .013 and partial-r (131) = .26, p = .004, respectively. No other predicted correlations were found to be consistently significant with Xu% across samples.

The results of the MRA using Xu% as the dependent variable for both samples are listed in Table 6. As predicted, R is significantly correlated with Xu% in a

Table 6. Summary Table of MRA with Xu% as the Criterion Variable and the Rorschach Variables of R, S, Dd, EI, P, D, Zd, L, PSV, CONFAB, WSUMSIX as Predictor Variables for Groups 1 and 2 from the University Sample.

		Xu%		
Group 1				
Step	Variable	R	Beta	p
1	R	.30	.09	.001
2	S	.38	.14	< .001
3	Dd	.42	.17	< .001
4	PSV	.44	.19	< .001
Group 2				
Step	Variable	R	Beta	p
1	R	.14	.02	.1
2	Zd	.28	.08	.005
3	D	.35	.12	.001

positive direction, Beta =.30 F(1, 129) = 12.64, p = .001 for Group 1 and Beta =.14, F(1, 131) = 2.74, p = .1 for Group 2. Five other variables were entered into the equations but they were different for each sample. Thus they will not be mentioned although they are listed in the table. R accounts for 9 and 2% of the variance, respectively for each of the samples.

Comparison of Group 1 and Group 2 Frequencies for Select MMPI Variables.

The two samples described above were used to compute five t-tests to assess the similarities between the two samples on the selected MMPI scales. The mean standardized T score for Scale 4 on the MMPI differed significantly between the two groups, M = 58.98, M = 62.38, respectively, t (1, 234)= -2.5, p =.013. No other significant differences between groups were found.

Correlations and MRA of Select MMPI Scales with Form Quality.

Pearson product-moment correlations were computed on all the following MMPI Scales: F, K, 4, 8, 0 with form quality to assess individual predictions of relationships between form quality and the above mentioned MMPI scales. Six MRAs using X+%, Xu%, and X-% as the dependent variables and the following MMPI Scales: F, K, 4, 8, 0 as predictor variables were computed using an MRA Forward (PIN

= .1) computer program. Two MRAs were computed for each dependent variable using the two separate samples described above.

Contrary to the predictions no variables were consistently and significantly correlated with X-% and no variables were consistently entered into the MRA equation for both samples. Contrary to the predictions no variables were consistently and significantly correlated with X+% and no variables were consistently entered into the MRA equation for both samples. Contrary to the predictions no variables were consistently and significantly correlated with Xu% and no variables were consistently entered into the MRA equation for both samples.

Summary. The University sample used in this study was significantly different from Exner's (1986) normative sample on 11 out of 12 selected variables. The one variable upon which they did not differ was R. Five out of 30 predicted correlations between form quality and select Rorschach variables were found to be significant and two more significant correlations were in direct contrast to what was predicted. Thus, seven out of 30 correlations were significant. P had a positive correlation with X+% and a negative correlation with X-%. Dd and Zd had a negative correlation with X+% and a postive correlation with Xu%. S had a negative correlation with X+%. None of

the other selected Rorschach variables or MMPI scales had significant correlations in the same direction in both samples. Using an MRA, P was the best predictor of X-% when R was entered on the first step. P had a negative correlation with X-%, when R was entered on the first step. The variables S and Dd, with R entered first, were the best linear combination of variables to predict X+%, using an MRA. S and Dd were negatively correlated with X+% and P was positively correlated with X+%. No variables were entered for both groups when Xu% was the criterion variable using an MRA and entering R on the first step. None of the selected MMPI scales were entered into an MRA equation for any of the three levels of form quality.

DISCUSSION

The present study had two main goals: a) to compare Exner's (1986) norms with the University sample on the Rorschach variables R, X+%, X%, P, S, Dd, Zd, L, EI, D(stress tolerance), WSUMSIX, PSV, and CONFAB; and b) to assess the relationship of form quality (i.e., X+, X-, and Xu) with select Rorschach variables (i.e., P, S, Dd, Zd, L, EI, D, WSUMSIX, PSV, and CONFAB) and select MMPI scales (i.e., F, K, 4, 8, 0). A number of t-tests were used to compare the two groups. Correlations, partial correlations and MRAs were used to assess the relationships between form quality and select Rorschach and MMPI variables.

Comparison of University Sample with Exner's (1986) Norms

Given the significant differences between the sample of volunteer college students and Exner's (1986) nonpatient adult sample on 11 of 12 select Rorschach variables it is important to try to understand their meaning. We will try to gain some insight into the meaning of these differences between the University sample and Exner's (1986) nonpatient adult sample by: a) comparing each variable for the University sample with other normative groups established by Exner (1986); b) evaluating any meaningful clusters of variables for the University sample relative to Exner's (1986) norms for nonpatient adults; and c) assessing any

differences in sample and procedure between the University sample and Exner's sample of nonpatient adults.

A comparison of each variable for the University sample with other normative groups established by Exner (1986) might allow some insight into the differences between the sample of volunteer college students and Exner's (1986) nonpatient adult sample. Dd, X+%, and S are very similar in value to frequencies for inpatient schizophrenics and/or depressives (Exner, 1986). The means for WSUMSIX, PSV, X-% ,P, Zd, D, EI, and L are similar in value to the means for depressives and/or character problems (Exner, 1986) See Table 7. Thus, the variables for the University sample are not consistently similar to any one normative clinical sample compiled by Exner (1986).

It is important to note that R is the one variable that does not differ. Thus, differences in other variables can not be attributed to differences in R between the samples. X-%, WSUMSIX, and PSV are not as similar in value to the schizophrenic sample as they are for the depressive and character-problem samples. This can be interpreted to mean that distortion in perception is not as great or pervasive as that seen in the inpatient schizophrenic sample (Exner, 1986). Fluctuations in perception better reflect those seen in depressive and character-problem samples (Exner, 1986), and may be more healthy than what is suggested by a low X+% and an elevated X-% (Exner, 1986;

Table 7. Summary of Means for Schizophrenic, Depressive, Character-problem, and Adult Nonpatient Groups by Exner (1986) and the University Sample for the Following Rorschach Variables: Dd, X+%, S, L, WSUMSIX, X-%, P, Zd, D, PSV, and EI.

Variable	Uni	Sz	Dep	C-P	Nonpt
Dd	3.51	3.62	2.86	2.59	1.73
X+%	.50	.53	.68	.70	.80
S	3.33	2.28	2.22	1.92	1.84
L	.69	1.23	.81	1.51	.59
WSUMSIX	6.73	16.88	6.98	6.52	3.96
X-%	.20	.31	.15	.15	.06
P	5.38	4.21	5.25	5.12	6.66
Zd	.02	1.04	.34	-.26	.84
D	-.6	-.16	-.99	-.68	.02
PSV	.25	.16	.18	.25	.05
EI	.43	.37	.32	.46	.39

Note. Uni=University; Sz=Schizophrenic; Dep=Depressive; C-P= Character-problem; and Nonpt=Nonpatient.

Weiner, 1966).

Putting the variables into categories of greater than or less than the nonpatient norms is helpful in understanding the meaning of the differences between the two samples. D, Zd, P and X+% are all less than the nonpatient adult norms (Exner, 1986). Taken together they suggest a limited amount of stress tolerance and cognitive effort in integrating and organizing visual stimuli, as well as an unwillingness to report conventional responses, relative to the nonpatient group.

S, Dd, L, PSV, WSUMSIX, EI and X-% are all greater than the nonpatient adult norms (Exner, 1986). Although PSV, L and EI are significantly different from the nonpatient adult sample means (Exner, 1986) the small differences between means suggests that they are not as interpretatively important as S, Dd, WSUMSIX, and X-%. The constellation of S, Dd and WSUMSIX suggest a greater amount of flexibility, creativity or looseness in thinking, and need for control or limiting of stimuli. The increase in S, Dd, X-%, and WSUMSIX could be interpreted in a more pathognomic or pathological light, suggesting that it represents a loosening of associations, a greater focus on unconventional aspects of stimuli, and a greater degree of oppositionality. Further information on the quality of S, Dd and WSUMSIX responses, such as developmental quality and the distribution of main versus additional S responses

(Klopfer et al., 1954) would help to better understand any possible underlying dynamics.

A comparison of the context, age, and education between Exner's (1986) nonpatient adult sample and the University sample would be helpful to understand what, if any, extraneous factors could be present that could be related to the differences between the two samples.

One prominent difference between the two samples was age. The University sample was more homogeneous in age. The mean age in Exner's (1986) sample was 29.18 and only 258 out of 600 subjects fell within the age range of the University sample. The other 342 subjects' age ranged from 34 to 64 (Exner, 1986). The mean age of the University sample was 19.06 and ranged from 17 to 32. Unfortunately, Exner (1986) does not supply separate norms for nonpatient adults comparable to the age of the University sample. Although Exner (1986) has demonstrated a high test-retest reliability over a number of years and found form quality to be consistent across all age groups, it is still plausible that age related factors, such as development of identity, are important at this age and affect form quality.

Level of education was one moderately influential difference between the samples. The University sample was only composed of subjects enrolled in college. Exner's (1986) sample was composed of 400 out of 600 subjects who

had either a high school degree or one to three years of college education. It could be that the education level of the subjects affects the responses they give. Two factors possibly related to education level are overachievement and experimentation. Subjects in college may tend to want to overachieve and create new ideas. The premise that college students tend to overachieve and create new ideas would be supported by the cluster of Dd, S, WSUMSIX, X-%, X+%, Xu%, P, and Zd variables being significantly different from the nonpatient adult sample means (Exner, 1986).

The context in which the Rorschach was given in the two samples may have also resulted in the differences between the two groups. A variety of studies have indicated that context and examiner-examinee relationship effect Rorschach responses (Carp & Shavin, 1950; Exner et al., 1978; Gross, 1959; and Lord, 1950). In fact, Exner et al.'s, (1978) results are similar to what was found in the University sample. That is, clients gave a higher frequency of Dd and lower frequency of X+% and P responses when tested by their therapist than if tested by a stranger (Exner et al., 1978). Exner et al., (1978) suggested that subjects formulate many responses but then classify them and select which responses to give. Exner et al. (1978) concluded that "this classification seems influenced by a variety of factors, beginning with perceptual accuracy and including social desirability, situational set, and

personal needs" (p. 37). Thus, although subjects in the University sample were given the Rorschach following Exner's (1986) standardized instructions and technique, other factors related to context may have affected the University sample.

A prominent difference between the two samples that is related to context was the use of a full battery of psychodiagnostic tests in the University sample in comparison to Exner's (1986) normative sample who were given only the Rorschach. Demanding more effort from the subjects by having them take a series of different psychological tests over two-days introduces the possibility of later tests receiving less active attention. A related factor is testing set. The order and type of tests administered prior to the Rorschach may have influenced the type of responses given (e.g., giving the Thematic Apperception Test before the Rorschach might encourage a set of imagination) by these two samples. It is unclear under what circumstances Exner's (1986) clinical adult samples were collected and whether full batteries were given to those subjects or just the Rorschach. It is possible that the variety and type of tests given to the University sample better reflects a clinical setting because of its similarity to both variety and type of tests used in the clinical setting. Thus, the present results may be more comparable to the clinical setting than

the nonpatient adult setting. More research is needed in this area.

The configuration of significant differences in means for 11 of the 12 variables in the University sample as compared to Exner's (1986) nonpatient adult sample seem to indicate nonpathology rather than pathology for the University sample. Exner's (1986) report that 10% of the nonpatient sample for adults have an X+% below 70% helps to support a nonpathological interpretation of the Univeristy sample. In addition, the dissimilarity of WSUMSIX, X-% and PSV values of the University sample with Exner's (1986) inpatient schizophrenic norms (i.e., several important indicators of schizophrenia or a severe thought impairment of some kind), also suggest a nonpathological sample. Extraneous factors such as age, education, overachievement, attentional differences, order and number of tests, context, and examiner-examinee relationship may be related to the differences between the two samples on the select Rorschach variables. More research is needed to test the validity of these hypotheses and to explore these factors.

Predictions of Form Quality from Selected Rorschach Variables

Partial correlations were computed to assess the relationship of form quality with select Rorschach variables. The results from the partial correlations using Rorschach variables suggest that there are some

complementary relationships between the different types of form quality and variables correlated with them. R, Dd, and Zd are associated with both the percentage of X+ and Xu responses. The greater the number of R and Dd the greater the percentage of Xu responses and the lower percentage of X+ responses. The negative correlations of R and Dd with X+% are consistent with Mason et al.'s (1985) factor analysis and Exner et al.'s (1984) finding. Neither research group included Xu. Within this sample of volunteer college students, R and Dd seem to represent the amount of effort a subject is willing to put into the test (i.e., utilize efficient cognitive style by reporting few and common percepts or invest more cognitive effort and report more uncommon percepts) and an attempt to express oneself, possibly in an uncommon or obsessive manner. On the other hand, the two variables could be indicative of the fact that as responses go up subjects tend to run out of common or conventional areas of the blot to respond to and begin to utilize less conventional or common areas of the blot.

Zd's negative correlation with X+% and positive correlation with Xu% suggests that it is associated with greater cognitive integration or differentiation. Zd refers to the amount of cognitive effort utilized in integrating the stimuli into separate objects with a meaningful relationship between them or the use of white

space in a meaningful manner (Exner, 1986). This direction of association of Zd to X+% and X-% is contrary to that predicted. A low Zd was considered to reflect underincorporation or a paucity of processing of the stimuli (Exner, 1986). It was predicted to be positively correlated to X+% and negatively correlated with X-% and Xu%, in that incomplete processing would result in an increase in unusual or poor responses. Adding this finding of Zd's negative relationship with X+% and positive relationship with Xu% into the constellation of R and Dd strengthens the hypothesis that an increase in Xu% is a reflection of an increase in involvement and personal effort in the test or a meaningful move away from conventional ways to perceive stimuli to a more personal or original interpretation.

The negative correlation of S with X+% but no complementary correlation with Xu%, or X-% contradicts the prediction that S would be positively correlated with Xu or X- and is consistent with the prediction that S would be negatively correlated with X+. Rorschach's (1964) and Exner's (1986) hypotheses that S represents oppositional and neurotic behavior does not seem to be as supported in these results as is Fonda's (1977) hypothesis that S is more healthy and represents strivings for mastery and autonomy. The constellation of S, Dd and Zd, further supports Exner's (1986) suggestion that X+% represents the

tendency to be conventional and cognitively efficient. That is, taken together Dd, Zd, and S's relationship with X+% suggest that subjects who invest more effort into the test give fewer conventional or common responses, relative to the normative sample of 600 adult nonpatients. Cognitive efficiency assumes that the common responses are easy to give and thus require less cognitive work to produce. Furthermore, Tegtmeyer and Gordon (1983) concluded from their work on S responses in children's Rorschachs that "relatively high frequencies of white-space responses...(are) related to cognitive complexity and more active mastery" (p. 615) rather than suggesting hostility. More information on the quality of S in this sample is necessary to understand the relationship between S and X+%. A breakdown of S responses into main and additional (Klopfer et al., 1954) might be useful for further assessment of S and its relationship with form quality. That is, Klopfer et al. distinquish between space responses that are incorporated into the percept, such as eyes or mouth (additional), from figure-ground reversals and those other responses that use the space area as a primary or main part of the percept, such as a space ship on Card II. This distinction may prove helpful in further understanding the type of cognitive process underlying the space response and its relationship to form quality in the University sample.

The complementary relationship of P with X+% and X-% further strengthens the hypothesis proposed by Exner (1986) that X+% is related more to measures of conventionality than anything else. As predicted, P responses were positively correlated with X+% and negatively correlated with X-%. Thus, as P goes up, X+% goes up and X-% goes down while there is no correlational relationship with Xu%.

Furthermore, P is the only Rorschach variable that is correlated, albeit mildly, with X-%. In the University sample, an increase in X-% is not associated with variables indicative of a thought disorder (i.e., WSUMSIX, PSV, CONFAB), elevated self-involvement or careless and low investment in the task. X-% is simply related to a reduction in the number of highly conventional responses. These findings suggest a benign, uneconomical, unconventional and stable nature of an elevated X-% in this sample of volunteer college students. That is, the number of X- responses given is independent of R and is not associated with a severe thought disorder or inappropriate behavior. Further evaluation of the quality of X- would be helpful to understand what sort of traits underlie these responses. This is especially true since these responses were not related to possible indicators of a thought disorder or self-involvement in this sample and this is contrary to standard practice where an elevated X-%, with concurrent depressed X+%, suggests a need for further

evaluation for a thought disorder or other perceptual deficits (Exner, 1986, Weiner, 1966). Exner (1986) also states that an overly affective state or pressing personal needs can result in an elevation of X-%. Further research that includes clinical populations might be helpful in investigating the nature and scoring of X-% across groups, contexts and time.

The high number of predictions that were unsupported, 23 out of 30 (excluding R), may have occured for a number of reasons. One possible reason is that although there were significant differences between variables there were not large absolute differences between the means. Several of the means for Rorschach variables (i.e., PSV, L, EI) from the University sample were within one standard deviation of Exner's (1986) means for the nonpatient adult sample even though they were significantly different. In addition, CONFAB was also very close to Exner's (1986) nonpatient adult norms. Rorschach variables, including D, WSUMSIX, and EI, that were significantly correlated for one subgroup of college students but not the other may prove to be related to form quality with a more heterogenous sample. For example, including members in a sample who are suffering from a severe amount of distress would help address the postulated relationship of D with form quality. Thus, samples with a wider range of scores may support the theory applied to form quality and related variables.

Other variables not included in this study may also be related to form quality.

Another reason for the high number of unsupported predictions is that the complex process of perception, as related to form quality, could be essentially independent of most of the variables selected. Other variables, such as affectivity, transient stress, quality of interpersonal relationships, and content need to be included in future research.

Predictions of Form Quality from Select MMPI Scales

Correlations between form quality and select MMPI variables were calculated to assess their relationship. Although theory and research suggested some relationships between form quality and both the validity and clinical scales on the MMPI, none of these predictions were born out. These nonsignificant findings are consistent with Dana & Bolton's (1982) work with college females. Dana & Bolton (1982) found that only 24 of 312 interrelations were significant between 32 Rorschach variables and ratios, using the Klopfer system, and 12 scales on the MMPI for women. They concluded that the one reason for few significant results was the relative normality of the sample. Thus, one reason why no significant relationships between form quality and the selected MMPI scales were found is that the University sample is relatively healthy.

Another possible explanation is that perceptual accuracy, as measured by form quality, is measuring something different from the behavioral and attitudinal self-report of the MMPI. More research into the theoretical and applied relationships between the two measures would be helpful. The use of a population with a wider range of mental health would be helpful for such research.

Predicting Form Quality from the Best Linear Combination of Select Rorschach or MMPI Variables

MRAs were used to evaluate what select Rorschach or MMPI variables would best predict form quality. For this homogenous sample of volunteer college students, P was found to the best predictor of X-% with R entered in the first step. Dd and Zd were found to be the best consistent predictors of X+% and no select Rorschach variables were found to predict Xu% with R entered on the first step. One reason for this low number of variables chosen to predict form quality is that the University sample is to homogeneous to truly tap the proposed theoretical differences of form quality. That is, more pathology would be needed to detect predicted relationships between form quality. In other words, there was an insufficient range of Rorschach scores in the sample to appropriately assess what variables are the best predictors of form quality. The lack of any select MMPI variable predicting form quality may also be due to the restricted range for each

variable within the sample. The use of a sample with a wider range, (i.e., include a variety of clinical groups), might better assess what variables are the best predictors of form quality.

Another factor that may account for the few variables selected to predict form quality is the interrelatedness among some variables. Variables that tend to cluster together may tend to overlap in the variance they account for and thus not be included in the MRA.

SUMMARY

The University sample differed significantly on 11 of 12 selected Rorschach variables. R was the only variable upon which the sample did not differ. This last finding is important because it allows us to focus on the differences between the samples and the relationship of other variables with form quality. That is, the differences can not be attributed to differences in R. X+% for the University sample was three standard deviations less than Exner's (1986) adult nonpatient sample and X-% for the University sample was almost three standard deviations greater than Exner's (1986) adult nonpatient sample. WSUMSIX for the University sample was more than one standard deviation greater than Exner's (1986) adult nonpatient sample. The other significant differences were within a standard deviation of the norms for the adult nonpatient. Taken together, these three variables suggest some large differences in conventional perception and thought between the two samples. The University sample seem to possess a larger amount of unconventional perception and thought.

Significant partial correlations suggest that X+% measures conventionality and cognitive economy. P has a significant positive correlation with X+%. R, Dd, Zd, and S all have a negative correlation with X+%. Together these variables suggest that an elevation in involvement in the

test, through a greater number of responses and increase integration of stimuli, and flexibility and unconventionality (e.g., figure-ground reversals) is associated with a decrease in conventional and highly common responses.

Significant partial correlations suggest that Xu% measures personal involvement in the test and idiosyncratic or unconventional responses. R, Dd, and Zd all have a positive correlation with Xu%. Together these variables suggest an elevation in the involvement in the test is associated with an increase in idiosyncratic or unconventional responses. The correlations are in the opposite direction of those for X+% and are complementary regarding the degree of involvement in the test. Measures of flexibility and typicality of responses react differently with X+% and Xu%.

Thus, X+% and Xu% seem to be opposite to each other on a dimension of conventionality. Xu represents unusual or original responses while X+ represents highly conventional responses. This is congruent with Exner's (1986) ideas on X+ and Xu and his criteria in classifying a response as either unusual or common. However, the mean frequency for each of these responses in the University sample is very discrepant with Exner's (1986) adult nonpatient frequencies. On the other hand, these interrelationships and frequencies are consistent with Rorschach's (1964)

belief that the scoring of good and poor responses should be independent of scoring original responses. Rorschach believed that original responses were important in understanding the quality of associations, life experiences and education of an individual. Rorschach (1964) concluded from his findings that more than 50% of original responses was more than optimal. Subjects with few good original responses were considered to be pedantic or depressed because of the high commonality of responses while those with more than 50% of their responses original and the majority of them good, were considered to be very introverted or "apart from the world" (Rorschach, 1964, p. 48). That is, someone who is more inward and thought oriented. This interpretation of unusual responses seems beneficial in interpretating the results of the University sample and suggests that Xu% be included in the Structural Sumary and Frequency Tables. X+% might be calculated as Rorschach (1964) did, i.e., as a composite of X+ and Xu responses. Xu might be calculated as Rorschach (1964) calculated original responses. Xu could be broken down into Xu+ and Xu- as Rorschach (1964) did and a comparison could be made between the number of overall good responses and Xu responses, and a comparison between Xu+ and Xu-. Xu- is the present X- category. More research is needed in understanding the explanatory power of original responses as suggested by Rorschach (1964) in his original work.

Significant partial correlations suggest that X-% measures something independent of X+% and Xu%. A part of what it measures is related to unconventionality as suggested by the negative correlation of it with P. However, no other variables, including R, were significantly correlated with X-%. Thus, whatever X-% is measuring it is relatively independent of the other variables, especially variables that indicate a thought disorder and related measures of severe psychopathology as measured by the Rorschach or MMPI. Thus, the results from this study suggest that X-% has a benign quality. A closer inspection of the quality and traits of X- responses in this sample of University students is important in understanding the meaning of these responses.

Finally, the method of splitting the sample and only discussing those significant correlations that occurred in both groups seems useful in this type of research. Setting the criterion that results must be consistent across groups to be considered significant is one type of cross-validation. The study is run twice on two subsets of the large sample. Results that may have been found in one large sample were not reported. This strategy handles the alpha error issue without losing the ability to find weaker effects that would be ignored using the Bonferoni adjustment criteria. With this strategy any results from the large sample are sample specific and do not have as

much power as results that are consistent across a split of the large sample. It is suggested that this technique be utilized in future research.

The purpose of this study was twofold: a) to compare the University sample means with Exner's (1986) means for a nonpatient adult sample; and b)to assess the relationship between form quality and select Rorschach and MMPI variables. Subjects for this study were recruited from psychology courses at a private university. There were 173 females and 95 males who participated in this study. Subjects were given the Rorschach along with a full psychodiagnostic battery of tests. The t-tests found that the mean for 11 of the 12 Rorschach variables significantly differed for the two groups (i.e., the University sample compared with Exner's (1986) nonpatient adult sample). R was the only variable that did not significantly differ. Thus the significant difference in means on the other 11 variables for the groups can not be attributed to R. The results seem to suggest that a significantly depressed X+% with a concurrently significantly elevated X-% is not a pathognomic indicator as typically considered when looking at a University sample. Partial correlations of form quality with select Rorschach variables suggest that X+% and X-% indicates the degree of conventionality and typicality utilized by subjects as suggested by Exner (1986). However, Xu% seems to indicate originality and

cognitive involvement in the test. Xu% and X+% may be on opposite end of the continuum of conventionality. For the University sample Xu% may be best understood and utilized as suggested by Rorschach (1964). No signficant correlations between form quality and select MMPI Scales were found. This may be due to the overall mental health of the sample or the differences in measurement of perception between the two tests. Few variables were selected in MRAs. This may be due to a lack of range of mental illness in the sample. Overall, the results suggest that perception, as measured by form quality on the Rorschach, can fluctuate according to context, education, age or other factors within a University sample. Further research is needed to understand the conditions in which perception can shift and the quality and quantity of its shift.

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The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

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