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I am submitting herewith a dissertation written by David Michael Winecoff entitled "Selected Aspects of Interpersonal Functioning in High Achieving Arts and Science Students." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

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SELECTED ASPECTS OF INTERPERSONAL FUNCTIONING IN HIGH ACHIEVING ARTS AND SCIENCE STUDENTS

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David Michael Winecoff

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DEDICATION

To my parents, Robert and Virginia.

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ABSTRACT

This study examined the interpersonal life of two groups of high achieving college students, students in the humanities (N = 43) and students in the physical sciences (N=41). The study represents one facet of a larger research effort by the Burstein and Loucks research group at the University of Tennessee which has obtained normative data on their new Rorschach scoring system.

Human Content, Human Emotion and Human Movement, have been empirically and theoretically linked with assessing object relations. These Rorschach scores were examined in relation to two objective measures of personality, Tellegen's Differential Personality Questionnaire (DPQ) (Tellegen, 1982) and Jackson's Personality Research Form (PRF) (Jackson, 1967). Intercorrelations, means tests, factor analysis and a discriminant function analysis failed to support the stereotype which states that science students are less interpersonally inclined than students in the humanities. Science students produced more idiosyncratic responses on the Rorschach and evidenced more interpersonal anxiety. Humanities students evidenced a greater need to be independent of others. The study showed that the "signs" approach to Rorschach interpretation is not valid.

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CHAPTER I

INTRODUCTION

Initially developed by Hermann Rorschach as a psychological experiment to study perception, the Rorschach Inkblot Test (Rorschach, 1942) has continued to be a dominant assessment instrument within a clinical psychologists' armamentarium. Rorschach's experiment has significantly contributed both idiographic and nomothetic information to the study of mental functioning within a broad spectrum of individuals and groups characteristically presenting differences in thinking and behaving.

Since its inception, the Rorschach has been used, among other purposes, to obtain information about how people think and feel about others. While this capacity varies within an individual on many different dimensions and in different circumstances, certain relatively stable idiographic patterns of interest in people can be said to be discernable to the skilled Rorschach clinician. Nomothetic trends, or descriptive characteristics specific to groups can also inform the Rorschach clinician. While the test has not been without its critics (Eyesenck, 1951; Jensen, 1955; Vizcarro-Guarch, Fernandez-Ballesteros, and Fernandez-Tresspalacios,

1987), its continued widespread use among clinical psychologists (Piotrowski,1984) and the continued teaching of Rorschach's test in clinical psychology programs (Burstein & Loucks, 1988) can be attributed to its usefulness as a diagnostic and research instrument.

Rorschach stopped short of tying his test to a prevailing theoretical orientation. He was, however, influenced by psychoanalytic theory, especially the works of Sigmund Freud and Carl Jung. Rorschach's empiricist tradition consisted of gathering data from different groups of individuals evidencing similar modes of "apperception" (Rorschach, 1942). Rorschach believed perception required "selection" and the process of "selection" reflected the investment of personality, life interests, variability of emotions, anxiety and level of activity (Piotrowski, 1957). Given the variability between individuals and groups, Rorschach was able to make between and within group distinctions based on differences in response sets. As a result of his investigations, he developed an elaborated system which enabled him to better understand the psychological life of the individuals and groups he studied. Rorschach's scoring system initially consisted of scoring each perception according to dimensions of form, movement, presence of color, content and whether the percept was

seen as a whole or in parts. Other dimensions of import included reaction times, card rejections and number of responses. Rorschach saw his system as an evolving one. While a number of different scoring systems have been developed, Rorschach's first scoring principles have remained inextricably linked to all other scoring systems which have since been developed in order to further understand mental life.

Of the different elements, often called "determinants", that are employed in scoring Rorschach responses, Human Content responses, or H, and Human Movement, or HM, have traditionally been thought to indicate multi-dimensional aspects of cognition which includes the capacity and desire for human relatedness. Accordingly, it was thought Human Content scores, Human Movement, Human Emotion and two objective measures of personality, which were developed to assess personality traits along a number of dimensions, including interpersonal attitudes and interests in people, could illuminate nomothetic or group differences in interpersonal functioning.

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* The author will employ Burstein's and Loucks' convention for scoring Human Movement, HM. Where Human Movement is otherwise scored as M, the reader will note this reflects human movement in the writings of other clinicians and in other scoring systems.

While Human Content and Human Movement are familiar to extant Rorschach scoring systems, Human Emotion is one of many newly identified scoring determinants in the recently developed Burstein-Loucks Comprehensive Scoring System (Burstein & Loucks, 1988). In most Rorschach scoring systems, Human Emotion is not considered separately but rather is combined with the Human Movement score. Burstein and Loucks (1988), assert that Human Emotion should be examined as an interrelated but distinct scoring entity as it also provides additional information about an individual's mental life. Like Human Movement, Human Emotion is associated with fantasies about people, however it is not uncommon for a subject to impart a fantasy involving emotion or movement onto animal percepts.

The Burstein-Loucks Comprehensive Scoring System includes all three scoring variables and will be used in this study in conjunction with the following statistically sophisticated objective personality measures: the Jackson Personality Research Form (PRF) (Jackson,D.N., 1967) and Tellegen's Differential Personality Questionnaire (DPQ) (Tellegen, A., 1982).

Purpose of the Study

In keeping with Rorschach's empirical model, this study seeks to examine the psychological life of two groups of bright and talented college students distinguished by chosen academic interests in the physical sciences and courses of study in humanities related fields. More specifically, these populations were selected in order to study whether group differences exist in their respective approach to human relationships. The study seeks to investigate the validity of an existing stereotype which suggests that students in physical science courses of study, e.g., chemistry, physics, engineering or biology are less interested in people than students who havee interests in the humanities, e.g., english, art, music, psychology and history. It is felt the Rorschach and the two personality measures are suitable instruments to study the student population as all instruments assess personality on a number of dimensions.

Theoretical Base for the Study

The evolution of psychoanalytic theory and practice has been of great import to the research applications of Rorschach's test. Contributions to object relations theory by Fairbairn, 1954; Guntrip, 1969; Kernberg, 1976;

and contributions to self psychology theory by Kohut, 1971, 1977; Gedo & Goldberg, 1973; and contributions from the ego school by Mahler, Pine & Bergman,1975; A. Freud, 1965; Jacobson, 1964; have provided a theoretical base from which to continue Rorschach's study of mental functioning. These theoretical contributions shed new light on the early development of relational capacities and psychic structures that develop into mature interpersonal relationships.

Briefly stated, these perspectives emphasize that early relationships are internalized by the infant into representational images as part of the process of cognitive development. This begins with the construction of vague, diffuse, and inconsistent sensorimotor experiences that are predicated on need gratification. The infant experiences these perceptions as either pleasureable or painful. These initial feeling states become the basis for developing schemata and early images and they are gradually expanded and developed into more complex, differentiated, realistic and individualized representations of self and other through the development of an increase in perceptual awareness (Mahler,et al.,1975). Representations of significant others in the infant's life become embedded in the developing matrix of experience in what Kernberg (1976) termed "self-object-

affect packets" through internalization of experiences of significant others. With increased development of cognitive functioning and experience with others in relation to self, the reciprocal interaction between past and present experiences causes the images of self and other to undergo constant revision. This cognitive growth causes a reorganization of experience into more complex schemas and consequently more sophisticated ways of relating to self and others (Blatt & Lerner, 1983).

It becomes apparent that these early relational experiences are of great import in forming underlying cognitive and emotional structures from which different personality traits develop and out of which develop individual differences in the desire and capacity for human relatedness. As these differences may be homogenized by conventions of social decorum and expectations to superficially get along with others, it becomes essential then to address not only manifest behaviors but also the more latent intrapsychic structures in order to understand relational capacities in different populations.

Review of the Literature

Human Content

Human content scores have been variously emphasized in importance by different Rorschach clinicians espousing diverse theoretical perspectives. This writer asserts that Human content scores are an essential scoring criteria through which substantial information about relational capacities in others can be gained.

Content scores were considered by Rorschach to be of secondary importance to human movement, color, form quality, and how the blot was perceived, i.e., was the percept derived from the whole blot a larger detail or smaller detail of the blot. However, because the test involves cognitive adaptation to external stimuli, he thought content scores could give the examiner information regarding the orientation towards work and the level of energy and adaptability in work situations. Rorschach thought his test could not acccess repressed traumata from childhood. He cautioned that interpretations based on content be considered in relation to "...all the behaviors in the protocol, and the behavior of the subject while interpreting" (Rorschach, p.122).

With the theoretical advances in psychoanalytic theory and the understanding that Rorschach's admonition

against content interpretations specifically addressed repressed traumata rather than general unconscious processes, contemporary Rorschach clinicians have given more attention to the meaning of content scores (Schachtel, 1966; Burstein & Loucks, 1988).

A number of clinicians have advanced the notion that content scores, independent of other Rorschach factors, consistently inform the clinician about unconscious motivations and actions which may not be prone to overt expression (Phillips and Smith, 1953; Lindner, 1947). They state the meaning of a particular content is, for the most part, a function of the subject and is not contingent on stimulus features of the blots. Lindner strongly felt that content scores were seriously neglected and exhorted his colleagues to more openly talk about their hypotheses regarding the meanings of content scores. Other clinicians have advocated interpreting contents in relation to the perceptual quality of responses as well as the total test record (Schafer, 1954; Holt and Havel, 1960; Piotrowski, 1957; Schachtel, 1966; Haley et al, 1967; Burstein and Loucks, 1988).

Commenting on Rorschach's charge to avoid using content interpretations to acccess unconscious processes, Schachtel (1966) stated that content seems to be related primarily to adaptation and defensive functioning rather

than overt expression of drives and impulses. However, he noted that disturbed people and normals who demonstrate few repressive tendencies show evidence of drives, impulses and their derivatives in content responses.

Rorschach discovered animal percepts were most frequently seen by subjects and accounted for 25 to 50% of all intelligent subjects'responses. Creative subjects were observed to respond with fewer animal responses (35% or less) contrasted to subjects who were less intelligent or stereotyped in their thinking (50% or greater). His comparison studies between content scores yielded a positive correlation between more human movement responses and fewer animal responses. He also found a relationship between personality makeup, as well as level of intelligence and creative capacity, with the frequency of whole human percepts versus percepts of a part or parts of a human. Normal, intelligent subjects, most schizophrenics, epileptics, organics, and hypo-manic individuals were found to perceive a greater percentage of whole human than part-human responses. Constricted individuals, unintelligent normals, depressed and anxious subjects, detail oriented people, psychotically depressed and non-confabulating retarded individuals gave more part-human than whole human percepts (Rorschach).

Piotrowski observed the second most frequent response category following animal percepts was the human response. Despite differences in meaning between human movement and human content percepts he thought human content percepts indicated the "...degree of interest in the psychology of other people" (Piotrowski, p.344, 1957). He cited the most frequent reason why some subjects do not see human percepts is because of felt hostility towards people and a desire to avoid interpersonal relationships. Exner (1978) and Weiner (1966) also indicated that the absence of human content signals a marked disinterest in people and limited empathic capacity. Phillips and Smith (1953); Rapaport et al., (1946); and Weiner (1966), note that just seeing human content does not indicate a desire for interpersonal involvement as a person may be sensitive and interested in others but uninvolved with people. For some, a preponderance of human contents may indicate pathological withdrawal from others. In these situations, the content responses may reflect an attempt to maintain only the most peripheral of interpersonal involvements. They state the paucity or complete absence of human content or quasi-human content points to a proclivity to withdraw from others and experience interpersonal anxiety. Further, a greater proportion of

human percepts indicates the extent to which social relationships are possible and are ego-syntonic. Unexpectedly high human responses may also be indicative of hypercriticality and oversensitivity to criticism as is characteristic of narcissistic disturbances (Phillips & Smith, 1953).

Piotrowski (1957) considered an over production of human percepts indicated a fear of people; and human profiles, typically seen along the edges of the blots, and other human detail reponses indicated a preoccupation with the motivations of others and significant interpersonal anxiety. From two separate samples, King (1958) found correlations of .15 and .20 between whole human and human detail responses. On the basis of these very low correlations, he suggested the correlations indicated the determinants might relate to different personality traits rather than the same constellation of traits as other clinicians had suggested.

Other Rorschach clinicians echo Piotrowski's thinking. Rapaport, Gill & Schafer, 1968; Klopfer, Ainsworth, Klopfer, & Holt, 1954; Phillips & Smith, 1953; Weiner, 1966; Haley, Draguns, & Smith, 1967; Mayman, 1967; Exner, 1974; stated human content, in general, indicates an interest in and potential to relate to others. Whole human responses were considered to

characterize more mature interpersonal capacities, whereas, quasi-human or human detail responses indicated more developmental and psychological immature attitudes towards people and impaired interpersonal capacities. Beck (1945), suggested a preponderance of human detail responses indicated constriction in the experience of the person.

Other studies have indicated human content responses increase with psychological development and age (Halpern, 1953; Ames, Metraux, Walker, 1952; Exner and Weiner, 1982) and are typically underrepresented in protocols of children eight years or younger (Ledwith, 1960; Francis-Williams, 1968).

H has also been examined in relation to various aspects of psychotherapy. Affleck and Mednick (1959) significantly discriminated veterans who prematurely terminated treatment from veterans who remained in treatment on the basis of H responses. The former produced fewer H responses than the latter. Lerner (1975) reported a study by Jonietz (1950) who similarly found pre-treatment productions of H increased after post-treatment testing in contrast to controls. Pruitt and Spilka (1964) also found human content responses distinguished subjects in group therapy from a control group. Following therapy, a retesting of the subjects

found more specific and less distanced human percepts than the control group. Comparisons of treatment modalities on the basis of quality of human content responses was investigated by Kavanagh (1985). He examined pre-treatment and post-treatment Rorschach records of 16 patients treated with psychoanalysis and 17 patients treated with psychoanalytic psychotherapy. He found the psychoanalytic patients produced more accurately perceived human percepts, more benevolent human responses and more articulated human percepts at the end of treatment when compared to pre-treatment records. For both groups, after treatment records showed more mature human interactions.

Not all studies have found that H changes following treatment. Rogers and Hammond (1953) reported no significant difference between pre-therapy and post-therapy H productions following a course of psychotherapy.

The relative absence of H has been observed in antisocial and criminal populations (Geil, 1945; Walters, 1953). Lerner (1975) reported a study by Edara (1957) who found a corresponding decrease in production of H with severity of offenses. Criminals convicted on sexual assault or robbery charges produced more H than

murderers. Repeat offenders also produced fewer H than first offenders.

While numerous studies have been conducted in efforts to better understand the meaning of H, differences in theoretical orientation and a lack of a conceptual framework have diluted the impact of these findings. Some Rorschach researchers have centered their investigations on Rorschach determinants on theoretical grounds. Studies rooted in object relations theory have most recently been initiated by Blatt, Brenneis, Schimek & Glick (1976) and Mayman (1977) and their colleagues. Aided by their respective research teams, their independent investigations led to the construction of measures for assessing relational capacities from the Rorschach. Blatt, et al. (1976) developed a system of assessing the concept of the object on the Rorschach by examining content scores of all H and HM percepts. Influenced by Werner's (1948) developmental theory, the system scores each human percept on the basis of differentiation, level of articulation, internality in the motivation of action, the degree to which the percept is integrated with perceived actions, and the nature of its interaction. Blatt and Ritzler (1974) initiated an investigation into boundary disturbances in a psychotic inpatient population by examining the object

representations and relational capacities as represented in human percepts on the Rorschach. They found that patients with greater boundary disturbances produced more distorted human responses. It was also found these patients were less likely to be emotionally engaged with other patients on the ward. They inferred from their investigation that distorted human percepts reflects an impaired capacity to form internal representations of others and that this impairment would be evidenced in interpersonal relationships. These findings led Blatt to develop the concept of the object scale.

In their first study of the concept of the object, Blatt, et al. (1976) found results to suggest that in the process of normal development there is a corresponding increase in human percepts accompanied by increased differentiation, integration, and articulation in the percepts. They concluded these factors are indicative of constructive and reciprocal relationships. They also found percepts which were accurately perceived by normals were significantly more differentiated, integrated and articulated than percepts produced by psychotics. However, those H responses which were produced by the psychotic group and which received a minus score for social appropriateness showed higher levels of articulation, differentiation and integration than the

normal group who produced fewer minus H scores. Those minus H content scores which were produced by the normal group were not invested with the fantasy material, the level of articulation, integration and differentiation that characterized the psychotic group response set. The authors concluded these findings suggested that psychotics were able to attempt mature relationships but only at the expense of compromised reality testing and conventional thinking. Ritzler, Zambico, Harder & Kaskey (1980) replicated these findings and offered the explanation that psychotics are able to construct an elaborate and advanced fantasy world but do not have the reality based ego resources to effectively cope with the demands of reality.

Krohn and Mayman (1974) attempted to assess the developmental level of their subject's object representations by examining Rorschach records, dreams and early memories with the "Object Representational Scale for Dreams". The system is similar to Blatt's in that all human percepts on the Rorschach are scored. Their results failed to demonstrate a strong relationship between human percepts and developed "object representations" although Spear (1980) used the scale to discriminate hysterical/impulsive borderlines from obsessive/paranoid borderlines and borderlines from

schizophrenics. Mayman's and Krohn's lack of success was partially attributed to methodological issues and the fact that the scale was developed to study dreams.

Urist developed a scale to specifically address interpersonal and intrapersonal object relations on the Rorschach (Urist, 1977). He obtained convincing data to suggest that an individual's internal and symbolic world as experienced towards self and others would be reflected in percepts on the Rorschach. He did not, however, look for overt behavioral manifestations of object relatednes.

These studies among others support the thinking that human content scores reflect internal representations of others. Further, the studies support the notion that H reflects a capacity for object relations, the quality of the relationship and information about attitudes toward self. (Mayman, 1967; Blatt & Ritzler, 1974; Lerner, 1975; Urist, 1977; Blatt, Brenneis, Schimek, & Glick, 1976; Blatt and Lerner, 1983; Lerner and St.Peter, 1984).

Mayman (1967) noted that a person who typically does not see human percepts may simply be unimaginative or unintelligent or interpersonally superficial and too reserved to become invested in the Rorschach. However, he stated it may more likely be the case that an individual will avoid seeing human percepts in the Rorschach because of disturbances in internalized good

objects. He stated further that interpersonal closeness may be perceived as threatening and may generate fears of losing one's identity and being engulfed by the other, or the person may distantiate himself from others to contain unacceptable impulses towards the other. When these circumstances occur, he stated it is repression that causes the individual to inhibit development or completely eliminate productions of fantasies of people.

Mayman (1967) suggested that another form of avoiding interprsonal involvement could be seen in the "dehumanization" of percepts reported as human. He described these responses as characterized by a cold and estranged interpersonal quality and an absence of interpersonal mutuality; in more severe forms these percepts signified "a warping of relationships, a depersonalization of others and a corresponding estrangement of the patient's sense of self" (1967, p.19).

Rapaport (1946) was skeptical about whether internalized representations of self and others could be ascertained from human percepts. He, instead, focused on the functions of the ego and tended to shy away from more interpersonal aspects of the individual (Blatt & Lerner, 1983).

Hertzman and Pearce (1947) investigated the question raised by Rapaport by administering pre-treatment and post-treatment Rorschachs to individuals entering psychotherapy with him. Following six months of treatment, the human percepts seen in the pre-treatment Rorschachs were examined by the therapist to determine which of the human percepts reflecting attitudes towards self and others had emerged during the course of psychotherapy. He found that 75 per cent of the human percepts seen in the Rorschachs had personal meanings for the subjects. Holt and Luborsky (1958) conducted a pilot study to assess the capacity for developing interpersonal relationships. Fourteen psychiatric residents were selected from the Menninger Foundation Selection Project and divided into two groups on the basis of clinical ability. Rorschach protocols from each subject were examined by independent raters to determine if they could distinguish whether human percepts had been produced by the best or poorest residents. Consensus judgments indicated the best residents saw more warm human percepts than the poorest residents whose human percepts were characterized by cynicism, bitterness, alienation and fearfulness of others.

In keeping with object relations theory, Burstein and Loucks (1988), divide Human content into scores which

they indicate are reflective of "...the quality and range of object cathexes..." (p.83, 1988). Human content is scored according to whether the subject sees a whole human, scored as H; a human face, scored Hf; a human detail exclusive of the face or head, scored Hd; mythological or distorted human-like characters, scored (H); and mythological or distorted human-like faces, scored (Hf) (p.83, 1988). This study will use Burstein and Loucks Comprehensive Scoring System (1988). It includes all responses containing human content excluding references to sexual anatomy, soft anatomy and bony anatomy.

Human Movement

Rorschach defined M in the following manner:

> Movement Responses are those interpretations which are determined by form perceptions plus kinesthetic factors. The subject imagines the object interpreted to be in motion .... answers may be considered as kinesthetically determined practically only when human beings or animals capable of motion similar to that of human beings (monkeys, bears) are seen in the figures (Rorschach, 1942, p.25).

Rorschach said the key point in determining movement lies in whether the subject actually experiences a "sensation of motion" (p.25).

The M response has long been considered by many notable Rorschach clinicians to be the keystone of the Rorschach scoring system (Beck, 1976; Piotrowski, 1957; Schachtel, 1966; Rapaport, et al., 1946; Exner, 1974).

Piotroswki stated, '" It constitutes Rorschach's most original contribution to the experimental study of personality, and it expresses the most developed aspects of personality from the standpoint of the human race and the individual (p.120)." Beck emphasized M "...opened the window into the unconscious" and provided personality researchers a "tool" for exploring the unconscious (Beck, p.79). Rorschach himself, noted human movement served as the primary vehicle for understanding the interplay of unconscious and conscious forces in human interactions (Rorschach).

Rorschach thought M responses indicated repressed fantasies involving action and, in fact, were basically equivalent in psychological meaning to dreams. He based this premise on the research efforts of John Mourly Vold (1850-1902), a Norwegian philosopher and psychophysiologist who devoted 25 years of research into the psychophysiological study of dreams. A two-volume set of his findings was published posthumously in 1910-1912 and significantly impacted on Rorschach's thinking (Ellenberger, 1954). Mourly Vold stated that kinesthetic images are fundamental to personality but they are repressed in waking states and only return to consciousness in dream states. He discovered that overt motor behaviors are negatively correlated with

kinesthetic imagery and fantasy and further found that restriction of movement increases kinesthetic imagery (Ellenberger, 1954; Piotrowski, 1957). Sigmund Freud's seminal work on dream interpretation also heavily influenced Rorschach's thinking about active mental images (Piotrowski, 1957). "Kinesthetic engrams act as inhibitors of physical activity; motor activity inhibits kinesthetic engrams" (Rorschach, p.80).

Always looking at the relationships between M and other Rorschach scoring variables, Rorschach observed human movement represented a multidimensional concept and included the following matrix of psychological processes: "...1. Predominance of personalized activity; 2. Intensive rapport; 3. Stable affect and motility, awkwardness, insufficient adaptability to reality and insufficient extensive rapport" (Rorschach, p.81). Rorschach thought these traits reflected a more generalized introversive capacity for psychological functioning characterized by an ability to think reflectively and to predominantly live within one's own internal world rather than live in an action oriented world outside of oneself. Rorschach differentiated between these two basic approaches to psychological functioning by naming the former, the "M type", and the latter, the "C type". Both constellations of mental

functioning represented poles of a continum of psychological functioning he called "Erlebnystipus" or - the experience balance. He otherwise referred to the M type person as introversive and the C type person as extraversive. Rorschach was quick to point out that his concept of introversion was derived from "colloquial" usage of the term rather than from Jung's concept of introversion. In contrast to Jung's notion that individuals were governed by psychologically incompatible introversive or extraversive personalities, Rorschach felt introversion and extraversion existed in the same person and represented a larger continum of psychological behaviors (Rorschach, 1942). Consequently, he found the Color (C) response addressed the affective and motoric end of the continum; "The more color in the test, the greater the emotional instability of the subject, the more kinesthesias, the more stable the affectivity" (Rorschach, 1942, p.76).

In 1937, Piotrowski defined the meaning of M from an empirical standpoint:

> The M represent the conception of life, according to which the individual makes his adjustment to reality....The M stand for the most individual and integrated strivings which dominate his life...[they reveal] the attitude that he takes toward his own future, toward other people, toward his work, toward what worries and pleases him.

Later, in 1957, he elaborated his thinking by stating the following:

> M is...comparable to a steering mechanism which directs the individual to play certain definite roles in those interhuman relationships that are vital to him; the M determine external conduct directly or indirectly but always materially and, therefore, are accessible to direct observation in the external motor behavior....The M indicate prototypal roles in life, i.e., definite tendencies, deeply embedded in the subject and not easily modified, to assume repeatedly the same attitude or attitudes in dealing with others when matters felt to be important and personal are involved....The prototypal M roles reveal whether the individual tends to be a leader or a follower, whether he likes to demonstrate his strength or to seek the protection of a psychologically stronger person whether interhuman relationships are experienced as enervating or stimulating, whether the individual is exhibitionistic or self-effacing, aggressive or cooperative, active or passive, etc. The prototypal role can be desirable or not, can be acceptable or unacceptable, can be an aid in the struggles of life or a severe handicap....The M indicate traits stabilizing the relation between the individual and his environment (Piotrowski, 1960, p.190).

Years later, Piotrowski (1957, p.130) supplemented the earlier description of M in stating M reflected "... all action tendencies which do not find a vent without turn inwards; as a result of repression, they become internalized and change into creative ideas." Beck echoed Piotrowski's thought. He stated M reflects the "psychological economy" of people by serving as an adaptive activity or "shock absorber" for stabilizing the

affects (1952, p.50) thus enabling the ego to process emotional tensions via "internal living" (Beck, 1976 p.84-85). Earlier, he stated the M person is moved by feelings which are withheld from overt expression. He said normal M producers sublimate and convert their feelings into "...achievement of the new..." whereas neurotics daydream and psychotics convert their feelings into daydreams which degenerate into autistic living (Beck, 1952).

Many different types of M responses are possible. Rorschach reportedly produced thirty different variations of HM responses (Piotrowski, 1977, p.190). Piotrowski differentiated between overtly "assertive-M" subjects whose percepts were effortful,i.e., "two people dancing" in contrast to overtly "compliant" subjects who gave passive responses, i.e., "a man lying on a log, sleeping" (1977, p.189).

Unlike many clinicians, Klopfer et al. (1954), Beck & Molish, (1967); Schachtel, (1966), Piotrowski adamantly stated percepts involving human movement are analogous to observable behaviors and are predictors of interpersonal behavior patterns. Discrepant views on whether percepts reflect only internal structure or both structural and behavioral aspects of relatedness to self and others continues to exist in the minds of some clinicians. The

issue has been empirically addressed by Rorschach clinicians whose theoretical investigations in object relations have made it possible to address both structure and behavior (Blatt, 1975; Mayman, 1967, 1977; Urist, 1977).

Mirin (1955) attempted to answer the question of whether manifest behavior towards people is represented in M percepts. Mirin constructed an experiment in which he identified exclusively assertive M producers from exclusively compliant M producers from a larger group of subjects. An examination of Rorschach percepts, particularly M, confirmed his hypothesis that type of M is closely linked to overt behavior and can identify how a person behaves in a psychosocial situation when the person is emotionally involved.

Contrasted with Piotrowski's notion that M responses potentially have overt behavioral equivalents, Rorschach thought the responses indicated inhibition of overt activities. He restricted his thinking to this definition on the basis of Vold's and Freud's independent studies on dreams and because of his self-observations that he easily forgot dreams when he awakened from sleep and had little difficulty remembering the dreams if he lay still in his bed and reflected on his dreams (Rorschach, 1942).

Other studies support M as assessing the capacity to respond to and understand others, accept self and others (Gage and Cronbach, 1955; Mueller, 1963; Taft, 1955, Mayman, 1977). Of the different meanings offered in explaining the M response, the capacity for rapport and empathy were singled out by Lerner (1975) as being directly related to interpersonal functioning and understanding of others. However, Mayman stated M percepts should be associated with other indicators of interpersonal warmth before being unambiguously associated with empathy (1967). In addition to the capacity to understand self and others, research on the relationship between M and empathy has focused on the degree and quality of interpersonal relationships (King, 1958; Mayman, 1967; Schachtel, 1966). Other research has focused on examining M as a predictor of therapeutic change (Muench, 1947; Cartwright, 1957; Dymond, 1948; Fey, 1954).

Speaking from an ego-psychoanalytic theoretical orientation, Mayman (1967) made significant contributions in advancing the understanding of M. He proposed that internal representations of self and others exists in the form of unconscious images. He stated these internalized objects formed the ground on which all relationships developed and became figural in the mental life of

people. He concluded the Rorschach provided a venue in which to examine these intrapsychic objects. He noted M provided a gateway into the internal world of people and consequently enabled inferential statements about relationships proper on an interpersonal level.

> The existence within the self of a storehouse of unconscious imagoes of early self/other relationships provides the substrate for all subsequent relationships. One's repertoire of object-representaions, and the feelings and relationship predispositions tied up in these images, may reveal much about a person's introjects. His fund of personal images reflects the socialization process to which an ego system has been exposed. It also tells us something of the imprint which socialization has made on him, and what he, even as an archaic unformed self, made of those interactions and events which he lived through from his first glimmerings of sensori-affective awareness (Mayman, 1977, p.243).

He stated further that the most dominant images affecting an individual's interpersonal functioning remain largely unconscious. Mayman said this perspective requires the Rorschach clinician to go beyond looking at the images posited by a subject; the examiner must attempt to understand the relationship of the percepts to the individual's "ego-system". That is, what can the percepts reveal about the subjects feelings for himself? Do the images tell us what the person admires or would like to become? Do the images reflect interpersonal fear or ambivalence? (Mayman, 1977).

In addition to suggesting M provided information about empathic capacities, Mayman also suggested that an examination of M enables the clinician to differentiate between empathy and "identification" in asseessing the quality of relationships between the M response and the subject. He stated empathy requires more mature psychological functioning in contrast to "identification". Empathy is made possible when a person can maintain self-other boundaries and share the experience of another without blurring or losing the boundary distinction. "Identification", on the other hand, reflects an incapacity to maintain the self-other distinction. Mayman said (1977, p.245):

> Identification dissolves self-other differences in order to reduce to an absolute minimum the separateness of self fromother; empathy does not. Identifications are not amenable to conscious self-reflection; empathy is carried out consciously or preconsciously, and under ego control.

It is through an analysis of the M percepts that Mayman thinks empathy or identification can be distinguished. He observed narcissistic individuals lose distance with the M response and identify with the percept by becoming the subject in the fantasy.

He distinguished empathic M types from identification M types on the basis of the following characteristics: empathic M types exhibited 1) a wide

range of images of others, 2) objective descriptions of the M percepts, 3) a good ability to speak to the feelings in the percept without sacrificing objectivity; identificatory M types exhibited 1) vividly reported M percepts 2) fabulized the perceived action with content not typically associated with the percept in contrast to positing realistic action, 3) became intensely absorbed in the behavior of the percept (Mayman, 1977, p.246).

The total number of M responses in relation to the form-level rating or social appropriateness is a very important indicator of an individual's psychological functioning. Urist (1976) calls attention to the fact that not all M scores are good indexes of empathy. The perceptual accuracy of a response is crucial as inaccurate percepts are more likely indicative of interpersonal difficulties. Minus form-level responses are thought to indicate poor social skills and deficits in ego organization (Klopfer and Davidson, 1962; Allen, 1966; Weiner, 1966) and ego regression (Beck, 1976). Beck noted M minus percepts indicated autistic creativity and severe unconscious struggles (Beck, 1945). Mayman emphasized the importance of good form quality in assessing interpersonal and empathic capacities as the number of M responses may only indicate the level of fantasy involvements with others and may be indicative of

an incapacity to form mature relationships. Since he reasoned the mental images of people are reflective of the individual's "ego-system", poor form responses indicated the presence of serious deficits in interpersonal relationships (Krohn and Mayman, 1974; Mayman, 1977).

Apart from the relationship to human relatedness, significant research efforts have been conducted in order to examine the relationship between M perceptions and cognitive functioning. Studies indicate M is correlated with creativity (Hersh, 1962; Dana, 1968; Dudek, 1968; Nickerson, 1969) the capacity to delay action (Singer, Meltzoff,and Goldman, 1952); Bendick and Klopfer, 1964; Dana, 1968), intellectual abilities and cognitive complexity (Rapaport, Gill and Schafer, 1968; Sommer, 1958; Dana, 1968; Nickerson, 1969), although Mason and Exner (1985) were unable to find significant correlations between M and WAIS subtest scores. Individuals exhibiting organic impairments or low intelligence reportedly have markedly reduced M percepts (Piotrowski, 1957, Bohm, 1958, Exner,1985). Consequently, caution should be exercised in attributing relational meanings to the percepts.

Human Emotion

Burstein and Loucks have included an additional indicator to round out the apperceptive experience involving fantasies about people. Just as an HM response is thought to indicate imagined action, attributing HE to the blot is similarly thought to indicate that a subject has imagined and bestowed the percept with some type of emotionally valent content. For example, (free association) " 'A hungry man.' (Inquiry)'He looks like he's tired and hungry -- his head is hanging down.' " (Burstein & Loucks,1988), would receive a scoring for HE and HM because the fantasy incorporates human action (HM) and emotion (HE).

Within their system, determinants are divided into Justifications and Imaginal Aspects. Justification scorings refer to justifying a particular percept on the basis of the objective characteristics of the blot. In contrast, Imaginal Aspects are produced by the subject in response to a personal fantasy or memory. For instance, if color were used to justify a percept, i.e., a rainbow because of the colors, the justification would be based on the objective characteristics of the blot, namely color; whereas, justifying a percept through ones' subjective experience receives an HE and/or HM score. Both HE and HM are considered Imaginal Aspects in the

Burstein-Loucks Comprehensive Scoring System. In using the subjective mode of organizing mental life, Burstein and Loucks note that Imaginal Aspects are produced by people intent on "...discovering external reality..." and further note that "...Imaginal Aspects as a group can be regarded as reflecting imagination or fantasy in the broadest sense. HM responses denote the imagination of a world informed by human motives and feelings" (Burstein and Loucks, p.21-22). Whereas HM represents the more ideational fantasy, HE can be seen to represent the more affective component of the fantasy. The Imaginal Aspects category also includes Animal Movement, Object Movement, Texture and Vista, however, only Human Emotion and Human Movement will be considered in this study.

The literature suggests that the same basic understandings about the psychological meanings accorded H exist within the HE and HM percepts. Interpretively, it is important to distinguish between individuals who offer different ratios of H to HM and HE percepts as the psychological meanings are interactively dependent on the ratio of H to HE and HM. For example, it is quite possible for a subject to see many H but no HE or HM percepts. An individual manifesting this response style might be described as interested in people but deficient in empathic functioning and more prone to impulsivity.

While H percepts are thought to reflect representational capacities of others and interest in self and others, HE and HM percepts are thought to represent more internalized, affectively charged and less static attitudes towards self and others.

Rorschach Research and Vocational Choice

Some studies have addressed behavioral equivalents of H and M scores in specific populations. Fernald and Linden (1966) compared 200 undergraduates' Strong Campbell scores with responses to The Holtzman Ink Blot Test. Subjects who rated themselves high on social interest on the Strong Campbell produced more H responses than either group with low or middle scores on social interest. Regarding the relationship between H and M scores and occupational choice, Lerner (1975) reported a study by Dorken (1954) in which he found medical interns who chose psychiatry as a specialty produced more H responses than other members in different subspecialities. Rieger (1949) found people who were involved in occupations requiring interpersonal involvement produced significantly more H responses than members of different technical professions, i.e., engineers.

Roe (1951) conducted a comprehensive investigation into the relationship of Rorschach determinants and

occupational choice. She examined the Rorschach records of anthropologists, biologists, physicists, clinical psychologists, experimental psychologists, industrial psychologists, and social psychologists. She found clinical psychologists distinguished themselves from other psychologists on the basis of H and M productions. Although the clinial psychologists produced more M than the other groups, they failed to produce better M responses. Higher H productions were demonstrated by clinical psychologists than any other group. Roe pointed out that these findings were difficult to disentangle from the fact that the Rorschach scoring and interpretive systems were developed by individuals with similar personality inclinations. Nevertheless, she concluded the findings support the thinking that clinical psychologists are interested in people. Roe stated this finding did not necessarily imply a better adjustment as the concept of adjustment very easily differs between groups with different ideas about what constitutes adequate adjustment. For example, she stated minimizing interpersonal interests seemed a satisfactory adjustment among the physicists and biologists as emphasizing an interpersonal orientation was to the psychologists. She implied society may in fact function more optimally given these differences.

Roe found a dramatic distinction between biologists and physical scientists which comprised one group and anthropologists and psychologists comprising a second group of social scientists. She found the former group to be more anxious and subject to fear of the unknown. She speculated this difference may be accounted for by her observations from life history data of the participants in which the physicists and biologists reported an early and longstanding independence from interpersonal ties. She found many of these individuals had suffered early parent loss or severe physical illness which she inferred seriously affected interpersonal relations. She suggested the adjustment process of avoiding interpersonal ties represented a basic repression of the need to be with people. She also found the psychologists and anthropologists had experienced disturbed interpersonal relationships but they had dealt with the turmoil differently by addressing it directly rather than avoiding or repressing it. Roe summarized her findings by concluding that the individuals in each group chose their respective vocation on the basis of interest. These interests were clearly evidenced in the content of the Rorschach percepts; biologists and physicists saw more plant responses, physicists saw more snow and explosions, anthropologists saw more clothing percepts,

biologists and anthropologists saw more anatomical percepts and psychologists saw more human percepts.

Kaback (1946) conducted a study in which she investigated the concept of the "Vocational Personality" type (p.6) by examining the Rorschach protocols of men engaged in professions of Pharmacy and Accounting and two groups of students who had or were about to finish their education and enter one of the two professions. Two other groups comprised of Liberal Arts Student and a Miscellaneous Vocational Group were also examined as controls for the study. The central question Kaback investigated was whether the students' Rorschach responses were consistent with responses of the men representing the professions the students were about to enter. Although no vocational personality type was found to exist, Kaback found the Pharmacists and Pharmacy Students produced fewer M percepts than the Accountants and Accounting Students. Ranking mean M productions from highest to lowest, she found Accounting Students produced the most M followed by Liberal Arts Students, Accountants, the Miscellaneous Vocational Group, Pharmacy Students and Pharmacists ranked last.

Roe also conducted a study of accomplished painters to investigate their personality structure and the relationship between personality and skill. She found

unusually high levels of non-human movement were emphasized in contrast to an underemphasis of human movement percepts. She also obtained more human detail than whole human responses from the painters. Neither a quantative or qualitative analysis of the Rorschach data enabled Roe to identify criteria for identifying the capacity to funtion as a successful artist. She concluded the Rorschach is an inadequate measure of creativity (Roe, 1960).

Myden (1960), on the other hand, examined two groups of non-creative and creative individuals with the Rorschach. Among his findings, he discovered the creative group produced almost twice the number of M responses than the non-creative group. Other findings enabled him to discriminate between the two groups. He explained the findings was due to the ready avaibility of primary process to the creative group contrasted to the emphasis on repression of fantsy material in the non-creative group. He reasoned the creative group had the capacity to create personalized constructions and live internally within themselves rather than being subject to the external world. He said this capacity for inner living liberated unconscious feelings that would otherwise, because of repression, limit the access to psychic resources thereby causing a person to be

disrupted by anxiety. Rather than acting out the repressed thoughts and feelings, the creative individuals found creative outlets to manage their mental life.

Other studies which employed the Rorschach to examine personality differences between groups representing different occupational interests were reported by Roe to be relatively unsatisfactory due to limited numbers of subjects, brief summaries of the findings or only averages of determinants reported by the researcher. She briefly described the findings from studies by Harrower and Cox who found physical scientists and engineering groups less interested in interpersonal relationships, somewhat compulsive, rigid and anxious with a proclivity for social withdrawal (Roe, 1956).

Summary

While many different perspectives have been offered by skilled Rorschach clinicians and researchers regarding the meanings of the Rorschach determinants, it is clear from the review of the literature that these determinants can inform the clinician and researcher about psychological functioning and more specifically about the capacities for interpersonal relatedness. Although principally used in the clinical setting as an idiographic measure, the literature suggests that

nomothetic studies can contribute meaningful information about the mental life of groups manifesting different interpersonal interests and attitudes.

Statement of Specific Research Questions

Four basic questions will be addressed.

1. The relationships among H, including H, (H), Hf, (Hf), Hd, HE and HM will be examined in the combined group data. (1a) Strong correlations are expected between the Rorschach variables. (1b) Strong within group correlations are also expected between the Rorschach variables.

2. Between group differences will be addressed for each Rorschach variable in question. (2a) Students with membership in the humanities group are expected to significantly evidence more H, Hf, HE and HM responses than students in the physical sciences group. (2b) No significant differences are expected between groups for the following human content responses: (H), (Hf), and Hd. (2c) The quality of H scores, HE, and HM, as judged by response appropriateness scores, is expected to significantly differ between groups. Students in the humanities group are expected to significantly evidence more appropriate (+) H content, HE and HM scores than the physical science students.

3. Group differences in the relationships between the Rorschach-DPQ and the Rorschach-PRF intercorrelations will be examined in order to extract scales for the factor analysis. (3b) Measures of interpersonal attitudes towards and away from people as found in the objective tests are expected to combine with H, HE and HM to produce higher order factors which describe a range of attitudes towards people.

4. Higher order factors indicating an interest in people are expected to discriminate between the two groups on the basis of differences in the respective orientations towards people.

CHAPTER II

METHOD

Participants

The participants in this study consisted of high achieving undergraduate students enrolled at the University of Tennessee in Knoxville. The participants are members in either the College Scholars program or the Honors Physics or Chemistry programs. All three undergraduate scholastic programs were developed specifically for students who excell in the Arts and Sciences. The College Scholars program and the Honors curriculum are alternatives to traditional undergraduate courses of study and constitute undergraduate majors.

Students participating in the College Scholars program are chosen on the basis of academic talent, creativity, and motivation to develop an independent course of study. In order to be selected, they submit an application for review, they present letters of recommendation acknowledging their academic potential and they are interviewed. There are no ACT or SAT requirements for membership, although these students' ACT, SAT and GPA scores are indicative of intellectual and academic potentials which far exceed the norm. The

students are able to construct their own program of study irrespective of the other students in the group. The interest areas are quite diverse and represent many different concentrations of study. Despite the diversity of interests among the College Scholar group, a basic dichotomy of academic interests exists within the humanities and within the physical sciences. Of the 48 students who participated in the study, 3 students declared interests in both the humanities and the physical sciences. Consequently, their scores were not considered in the data analysis. Students with interests in the humanities are represented by the following courses of study: English Literature, Chinese Literature, Psychology/History, Creative Writing, Photography/Film, Russian Language/Literature, International Economics/History, German and Russian Writing and Theatre/Acting. College Scholars with interests in the physical sciences are represented by the following courses of study: Biology/Biochemistry/Pre-Medicine, Zoology, Bio-Sciences, Microbilogy, Biology/Physiology, and Bio-Physics. Students in the College Scholars program who indicated interests in both the humanities and physical sciences declared interests in the following courses of study: Genetic Research/Music, Pre-Medicine/Ceramics, Pre-Medicine/English.

Students who are enrolled in the Honors Chemistry and Physics curriculum have different academic requirements for membership. The Chemistry students must have obtained a minimum ACT score of 29, or a minimum score of 1200 on the SAT and a minimum of one year of chemistry in high school. The Physics students must have taken one-half year of trigonometry in high school, they must have obtained a minimum ACT score of 28 or a minimum score of 1150 on the SAT and must maintain a minimum 3.2 grade point average in the program. Representative areas of academic pursuit within this Honors program include the following: Aerospace Engineering, Bio-Chemistry, Electrical Engineering, Engineering Physics, Mechanical Egineering, Pre-Medicine, Zoology and Reproductive Endocrinology, and Microbiology.

Given the basic dichotomy in the groups between interests in the humanities and in the physical sciences, the students were grouped accordingly into three categories on the basis of academic interests. Of the 98 students who began the study, 90 students completed all of the testing; 43 students in the humanities group, 41 students in the physical science group remained and 6 students with interests which bridged the humanities and physical sciences. All 6 students from the third group completed the study. The subjects ranged in age from 17

to 51 and the mean age for the sample was 20 years. The subjects academic status spanned from the freshman to the senior year.

The data for this study were gathered over a period of four years. The data collection first began in the 1983-1984 academic year in which 16 College Scholars were tested. The remaining College Scholars and Honors Physics and Chemistry students were tested in the years following. In 1984-1985, 26 subjects were tested, in 1985-1986, 41 subjects participated and in 1986-1987, 31 subjects participated in the research project.

Not all of these students in both groups volunteered to participate in the study. Of the students whose participation was solicited by letter and a follow-up phone call, 60% of those solicited chose to remain in the study. Since members from both groups chose to not participate in the study, any confounding effects which might lead to group differences in the data are expected to be minimized.

All of the student participants were screened for a history of psychological symptoms. Students endorsing any of the designated stop items on the Cornell Index were not included in the study.

Procedure

This study was made possible through participation in the Burstein-Loucks Research Project. A central aim of this longitudinal research project involves collecting normative and research data from different personality measures from specific populations. The College Scholars and Honors Chemistry and Physics students represent two such groups.

Student participants were administered a number of personality measures and interviewed by research team members involved in the Burstein-Loucks longitudinal research project. All research team members participated in collecting and scoring the data. Each team member is a graduate student in the clinical psychology program at the University of Tennessee and is familiar with test administration and scoring procedures. Random assignments are made between each researcher and a prospective student participant. Each research team member was responsible for coordinating and completing the testing with each subject. The testing was usually conducted over two testing sessions lasting 2-4 hours each. In the first session, demographic data was obtained and the objective personality measures were completed. The order of the objective measures was counterbalanced to minimize effects of test order. The

follow-up session was used for administering the Rorschach and conducting an audiotaped interview.

Personality Measures

1. The Jackson Personality Research Form (PRF) (Jackson, 1967) was first published by Douglas Jackson in 1967 and reflects many technical advances in test construction. It was last amended with additional statistical information in 1974 (Jackson, 1974). The test is a true-false, self-report inventory and is theoretically derived from Henry Murray's personality theory. The PRF can be administered individually or in groups. It is available in parallel short forms A and B and consists of 300 items and two longer parallel forms AA and BB consisting of 440 items. Forms A and B yield scores on 1 validity scale providing an index of carelessness and 14 the following personality attributes: Achievement, Affiliation, Aggression, Autonomy, Dominance, Endurance, Exhibition, Harmavoidance, Impulsivity, Nurturance, Order, Play, Social Recognition, and Understanding. Descriptions of the scales can be found in Appendix B. The longer form includes the short form scales plus 6 additional trait scales and two additional validity scales. The shorter form is used in this research effort because it is more reliable than the long form (Anastasi, 1972,p.297).

In developing the PRF, Jackson selected 20 personality constructs from Murray's taxonomy and along with a group of item writers began to generate 100 items for each trait. These initial items were then reduced by editors to a pool of 2,554 items. This item pool was administered to college students and factor analyzed to yield forty items for each trait. Twenty items were then selected for each trait on the basis of high biserial correlations within a content scale, low correlations with other trait scales, endorsement frequencies between 5% and 95% and high "content saturation" between items which was determined by comparing the shared variance of the proposed content scale and the shared variance of a social desirability scale (Wiggins,J., 1972,p.301).

The instrument is an appropriate measure for two basic reasons. First, unlike other personality measures such as the Minnesota Multiphasic Personality Inventory, the PRF was designed to measure normal personality constructs rather than pathological indices of mental illness. To that end, the PRF was standardized on normal populations. Normative data were gathered on several groups for Forms A and B, among which were college students. Secondly, the PRF design and validation criteria meet high psychometric standards because validity was built into the test with each step in its

development. It has average test-retest reliability coefficients ranging between .89 and .94 for the 14 continuous personality scales. The manual reports median K-R 20 reliability coefficients of .91 with a range of .87 to .94 (Jackson, 1974, p.20) and odd-even median reliabilities of .78 and .81 for forms A and B, respectively (Kelley, E.L., 1972, p.123). Validation data demonstrate the PRF scales uniquely and accurately measure each personality construct. Convergent and discriminant validity studies using the PRF, blind behavioral peer ratings and self ratings correspond closely with the trait scales to yield a strong median correlation of .52. Jackson states in his manual (1974, p.20) that

> (a) standard deviations are large, indicating good separation of subjects both on the longer and on the shorter scales; and (b) reliabilities are unusually high for personality scales, as high as any ever recorded for a comparable number of published personality scales.

For these reasons, the PRF is considered to be psychometrically sophisticated, robust and an appropriate research instrument for this study.

2. The Differential Personality Questionnaire (DPQ) was developed by Auke Tellegen and first published in 1982. The test is a factor analytically derived self-report questionnaire. It contains 300 true-false

statements and is atheoretical. It is not tied to a specific personality theory but the factors represent personality dimensions which have been proven to be empirically corroborated in the earlier work of the following personologists: Block, Cattell, Comrey, Eysenck, Gough, Guilford, Jackson, Loevinger, Lykken, Shor, Welsh, and Wiggins (Tellegen, 1982). The test can be administered individually or in groups. The test yields 11 primary non-overlapping personality dimensions, 3 higher order dimensions or scales and 6 validity scales. The 11 primary dimensions are as follows: Wellbeing, Social Potency, Achievement, Social Closeness, Stress Reaction, Alienation, Aggression, Control (vs. Impulsiveness), Traditionalism and Absorption. A description of the traits can be found in Appendix A. These primary dimensions have been factor analyzed to form the following 3 higher order dimensions: Positive Affectivity, Negative Affectivity and Constraint. The 6 validity scales are as follows: Associative Slips, Unlikely Virtues, Desirable Response Inconsistency (DRIN), True Response Inconsistincy (TRIN), Variable Response Inconsistency (VRIN), and Index of Invalid Responding (INVAL). (Tellegen, 1982).

The DPQ is also a psychometrically sophisticated and robust instrument. Test-retest reliabilities for the 11

primary factors range from .82 to .92, after a thirty day test-retest interval. Alpha coefficients for the college students range from .76 to .89. Tellegen notes in his manual that " The structure formed by the DPQ dimensions is clear and replicable, and is thought to be conceptually informative. Its measures have acceptable internal consistencies and retest reliabilities, and are meaningfully related to other test and nontest variables" (Tellegen, 1982, p.1).

Recent research undertaken by Loucks, Glass and Burstein (unpublished manuscript in preparation, 1987) addressed the issue of item overlap between the two personality measures. It was discovered that similar scales had a maximum of 5% of their items in common. The estimate of the proportion of shared variance between similar constructs was derived by subtracting the percent of common items from the total percent of variance shared between the scales. When compared, the proportion of common items was insufficient to account for the proportion of shared variance. Consequently, the item overlap existing between the two measures does not endanger this present study (Saxton, L., 1987).

3. The Cornell Index (CI) was used to screen for the presence of severe psychiatric conditions. The test was developed during World War II to quickly assess large

groups for the presence of psychiatric and psychosomatic disorders. The instrument was normed on 600 individuals without significant psychiatric difficulties and 400 individuals presenting with significant emotional disturbances. Reliability coefficients for the 1,000 subjects who were tested at five different sites around the United States was .95. (Weider, Wolff, Brodman, Mittlemann, and Wechsler, 1949).

The true-false, self-report test consists of 101 questions about the prevalence of psychological or psychophysiological problems. Three items which evidenced the greatest psychological difficulties were considered "Stop Items". A subject would be withdrawn from the study by endorsing any of the following items: 1.)" Did you ever have a mental breakdown?" 2.) "Were you ever a patient in a mental hospital?" 3.) "Have you been arrested more than three times?" (Weider et al, 1949), or a total score of 13 or more endorsed items indicating significant psychological difficulties (Weider et al, 1949).

4. The Rorschach Inkblot Test consists of 10 cards on which ambiguous and novel patterns of ink blots have been placed. No two cards are alike. Five are achromatic and the remaining five are both achromatically and chromatically colored. The task for the subject is

broken down into two primary components. The participant's responses in each step are recorded verbatim by the examiner.

First, in what is called the free association, the subject is asked to tell the examiner everything that the blots look like. Rapaport, Gill and Schafer (1968, p.276) described three cognitive operations in formulating a percept:

> In the first phase, the salient perceptual features of the blot initiate the associative process; in the second, this process pushes behind these partial perceptual impressions and affects a more-or-less intensive organization of the inkblot; in the third, the perceptual potentialities and limitations of the inkblot act as a regulating reality for the associative process itself .

Contrary to the misunderstandings of some people, the free association does not imply randomly associating to the blot with whatever may come to mind; rather, it involves the effortful association of an object (human, animal or inanimate) which the subject thinks looks like the blot or specific parts of the blot.

Secondly, after completion of the free association, the examiner returns to each card in the order presented and elicits the subject's justifications for each perception. This in an attempt by the examiner to access the subject's cognitive and emotional reasoning for the perception and to, as completely as possible, record the subject's experience. The individual perceptions are

then scored along several dimensions and categories according to a systematic analysis of the information. The basic task of such an analysis is to reduce the amount of data that has been generated, without sacrificing the subject's experience, into more manageable units of information (Burstein and Loucks, 1988). While the data reduction represents an abstraction and reflects only part of the larger whole of the subject's perceptual experience, any scoring system must remain systematically connected to the concrete emotional and cognitive behaviors of the subject.

The Rorschach is particularly useful in assessing the mental life of people because the blots are ambiguous stimuli on which the motivated subject projects images reflective of his or her representations and mental structures which comprise the individuals' psychological life. An examination of the percepts that a subject offers correspondingly affords the Rorschach clinician a unique opportunity to understand how the individual lives, both internally and externally; and more specifically, provides an opportunity to examine how the subject relates to self and others. The ambiguity of the blot stimuli ensures each subject the freedom to construct an individualized response set. Response similarities in subjects with similar interests and

personality structure do exist as noted by Rorschach himself, and it is on this ground that the Rorschach is employed in this investigation. Because of the ambiguous nature of the stimuli, the findings from this investigation will be considered more a function of similarities and differences in the psychological life of the populations studied and less a function of test artiifacts.

Many different scoring systems exist. Primary Rorschach architects include Beck (1961), Piotrowski (1957), Klopfer, (1954,1956), Rapaport-Schafer (1945, 1946), Exner (1974) and most recently, Burstein and Loucks (1988). The Burstein and Loucks Comprehensive Soring System was developed as an answer to numerous scoring inconsistencies and conceptual discrepancies within the various scoring systems in use today. And more importantly, the system was developed in order to link the Rorschach to a particular theoretical orientation to better understand cognition and apperception. It represents a synthesis of features from other scoring systems of Beck, Holt, Blatt, Holzman and Exner. Their system is the first published comprehensive scoring system to conceptually wed the Rorschach with psychoanalytic theory. The authors feel this synthesis enables a more complete assessment of cognition and

personality and more centrally addresses the underpinnings of mental life rather than assessing isolated personality characteristics derived from the sign approach. In accordance with Rorschach's notion of assessing specific populations to identify group personality characteristics, the authors advocate norming their scoring system with specific criterion groups rather than "normal" and pathological populations (Burstein & Loucks, 1988).

Burstein's and Loucks' new Rorschach scoring system employs 168 dimensions from which any given response receives a number of meaningful scores. Their system is more rich in the amount of meaningful data it accesses from the responses and it is a more theoretically sophisticated system than other systems currently in use. While there are numerous scoring categories that could be considered to address the issue of interpersonal functioning, this study will only employ a very small subset of Rorschach scores from their comprehensive scoring system. The scores to be considered in the study include the following: Human Content scores denoted by, whole human designated by H, quasi-whole human designated by (H), human face designated by Hf, quasi-human face designated by (Hf), human detail designated by Hd, cut-

off human detail designated by Hdx; Human Emotion designated by HE; Human Movement designated by HM.

Scoring Procedures for the Rorschach and Objective Measures

All members of the research team were trained in administration and scoring procedures specific to Burstein's and Loucks' system. Following the administration of the Rorschach, each record was initially scored by the examiner. The record was then scored by another experienced team member who was blind to the purpose off the study. A reconciliation between the first and second scorers was performed by two additional experienced group members to correct any mis-scorings. Any discrepancies between the two reconcilers were taken to the authors for final arbitration.

Despite the estimated 10 to 12 hours required to complete the administration and final scoring of each record, the authors think this alternative method of maintaining interrater reliability is much more appropropriate and robust in Rorschach research than traditional reliability measures. After the scoring was completed, a reliability check of the scoring was conducted on the Rorschach variables employed in the study. Human Movement was reliably scored 91.67% of the time; Human Emotion was reliably scored 80.77% of the

time; and all of the Human content scores were reliably scored 92.00% of the time. The data were entered into the computer and checked for entry errors. The data were represented as percentage scores by partialling out the effects of number of responses (Blatt and Berman 1984). Hence, effects from the number of responses per subject is removed thus making the data less subject to statistical artifacts. The data were digitized and readied for analysis.

Both the DPQ and PRF were hand scored with scoring templates and entered into the computer. After reliability checks the data were digitzed in the same manner as the Rorschach data.

Research Questions and Statistical Methods Operationalized

1. Problem (1a) required computing a combined group inter- correlation matrix to test for hypothesized relationships between Human content scores H, (H), Hf, (Hf), Hd, HE and HM.

Problem (1b) required computing an intercorrelation matrix to test for the hypothesized within groups relationships between the Rorschach variables.

2. Problem (2a) required computing t-tests to examine differences between the groups mean scores on the following Rorschach variables: H, Hf, HE, HM.

Problem (2b) required computing t-tests to examine differences between the groups mean scores on the remaining Rorschach variables: (H), (Hf), Hd.

Problem (2c) required dividing the Rorschach variables of each student group into two groups of appropriate (+) and inappropriate (-) H, HE and HM responses and computing t-tests for differences between group means.

3. Problem (3a) required computing intercorrelations between the Rorschach variables and selected DPQ and PRF measures. Relationships between the Rorschach variables and the objective measures were examined in order to select scales which represented a range of interpersonal attitudes.

Problem (3b) required applying factor analytic techniques to the Rorschach variables and selected trait scales in order to obtain higher order factors of attitudes towards people.

4. Problem (4) required performing a discriminant function analysis to determine whether the two groups can be distinguished on the basis of higher order factors which address attitudes towards people.

CHAPTER III

RESULTS

Group Membership and the Rorschach Variables

Pearson-product moment intercorrelations were computed for the following Rorschach variables: response appropriateness, human content scores, human emotion and human movement. Table 1 contains an intercorrelation matrix of those variables for the grouped Rorschach data. Descriptive statistics for Human Content scores, Human Emotion and Human Movement for both groups are located in Appendix C.

The expectation that all of the human content scores, Human Emotion and Human Movement would correlate highly was not completely supported by the analysis. Of the variables which did significantly correlate, HM correlated highest with whole human content, H, (.74, $p < .001$). This was expected as the research literature suggests a relationship exists between the variables. HE, also showed a significant relationship between HM (.38, $p < .01$) and H (.35, $p < .01$). Somewhat surprising is the finding that within this subset of whole human content scores, special case whole human content, (H), showed a very weak relationship with HE (.17). The low correlation between H and (H) of .15 is

Table 1 Rorschach Intercorrelations for Combined Groups (n=84)

Rorschach Variables	R+	R-	HE	HM	H	(H)	Hf	(Hf)	Hd	Hdx
Response (+)										
Response (-)	-1.00***									
Human Emotion	-16	17								
Human Movement	-07	08	35*							
Whole Human	05	-05	35*	17						
Whole Human (Special)	-04	00	17	39**	15					
Human Face	-10	12	01	07	-16	-10				
Human Face (Special)	-04	05	-15	-14	-13	06	06			
Human Detail	-11	11	-04	01	-03	27*	00	00		
Cut Off Human Detail	18	-19	-13	-23	-14	-15	00	-14	-04	

Note: Decimals omitted. *p <.01. **p.<.001.
*** Response (+) and Response (-) are mutually exclusive categories.

most parsimoniously explained by the fact that it is very rare for both human and quasi-human contents to co-occur within a given percept. (H), however, showed a mild significant relationship with HM (.39, $p < .01$). It is interesting to note that only whole human percepts significantly correlated with fantasied movement, HM and fantasied emotion, HE.

Turning to human detail responses and their relationship to H and the Imaginal Aspects, the data suggest that little relationship exists between these variables and whole human percepts, H and (H), and the Imaginal Aspects, HE and HM. From the intercorrelation matrix in Table 1 the reader will note very low positive correlations and even low negative correlations between the human detail determinants and the H, HE and HM scores. Within the subset of human detail responses only human face, Hf, and human detail, Hd, showed a mild but significant relationship (.27, $p < .01$). This finding was expected. However, the virtual absence of strong relationships between incomplete human content responses and whole H, HE and HM was not expected. Additionally, very low positive or low negative relationships exist between Hf, Hd and (Hf) variables indicating little or no relationship between these scores.

Within groups intercorrelations were computed to examine the relationships between the Rorschach variables (Table 2). As was previously observed in the grouped data, the highest correlation within the physical science group occurred between H and HM (.75, $p < .001$). (H) showed the next highest correlation with HM (.53, $p < .001$) followed by HE with HM (.46, $p < .01$) and HE with H (.45, $p < .01$). (H) showed a significant negative relationship with (Hf) (-.38, $p < .01$). Otherwise, no other significant relationships occurred. Whole human percepts, HE and HM showed very weak positive or weak negative relationships with Hf, (Hf) and Hd responses as was the case in the grouped data analysis. Correlations were not computed for cut-off human detail responses given the infrequency of this response by the science group.

A within group intercorrelation matrix was computed for the sample with academic interests in the humanities (Table 2). Again, although somewhat lower than the science group, an expected high correlation occurred between HM and H (.67, $p < .001$). Surprisingly, and contrary to predictions, very low correlations occurred between HE and H (.14) and HE and HM (.22). A significant positive correlation was obtained between

Table 2 Rorschach Intercorrelations for Humanities Students

Rorschach Variables	R+	R-	HE	HM	H	(H)	Hf	(Hf)	Hd	Hdx
Response (+)			-14	-22	-08	-11	-11	-25	-13	23
Response (-)	-1.00***		14	22	09	06	14	28	11	-25
Human Emotion	-15	15		22	14	16	04	44*	-06	-22
Human Movement	02	-01	46*		67**	24	01	01	08	-40*
Whole Human	13	-12	45*	75**		06	-09	01	06	-22
Whole Human (Special)	01	-02	26	53**	23		-14	10	21	-24
Human Face	-11	11	00	09	-19	-07		27	30	00
Human Face (Special)	16	-15	-14	-27	-24	-38*	-07		-02	-20
Human Detail	-10	10	-05	-01	-06	02	27	01		-06
Cut Off Human Detail	.	.	.	.	.	.	.	.	.	

Note: *p <.01. **p.<.001. "." indicates a coefficient could not be computed. Decimals omitted. *** Indicates R+ and R- are mutually exclusive categories. The Pearson product-moment intercorrelation matrix for Humanities students (n=43) appears above the diagonal; the intercorrelations for Science students (n=41) appears below the diagonal.

special case Hf and HE (.44, $p < .01$) and a negative relationship was found between human cut-off detail and HM (-.40, $p < .01$).

In summary, the data do not support, in toto, the expectation of high correlations among the Rorschach variables for the pooled groups nor do the data support the expectations for within groups. A consistent finding across the three intercorrelations indicates a moderately strong relationship between H and HM thus corroborating research findings previously discussed. Another rather stable finding across the three intercorrelation matrices indicates few significant relationships exist between H, HE and HM as a distinct class of theoretically and statistically related variables versus Hf, (Hf), Hd and Hdx responses which, on the basis of the correlations, represents a class of statistically unrelated variables. (H) seems to fall within a category unto its own sharing an association with HM in the grouped data and science students and also sharing a negative association with (Hf) within the science group.

Between Group Differences on the Rorschach Variables

Independent t-test comparisons were computed between the two groups on all of the Rorschach variables rather than computing z scores (Besag, F & Besag, P., 1985).

Only some of the predictions were bourne out in the data analysis.

Contrary to the predictions, students comprising the science group evidenced significantly higher scores on the Imaginal Aspects variables: HE (F=4.16, 2-Tail Prob. .000) and HM (F=1.94, 2-Tail Prob. .033) than students in the humanities group. Whereas no significant difference between groups was predicted for Hd, the science group did significantly produce more Hd responses than the humanities group (F=3.02, 2-Tail Prob. .000).

As expected, students in the humanities group significantly produced more H, (F=2.00, 2-Tail Prob. .025), and more Hf, (F=2.29, 2-Tail Prob. .008) than students in the science group. An unexpected finding for the humanities group was a greater production of Hdx (F=3.14, 2 Tail Prob. .000).

Scores that did not significantly differ between groups included (H), (F=1.23, 2-Tail Prob. .497), and (Hf) (F=1.09, 2-Tail Prob. .786). These data did support the expectation of no differences between groups.

A closer within subjects inspection of the Rorschach data was conducted to examine the quality of human content, human movement and human emotion responses produced by each group. This involved examining the social appropriateness of H, HE and HM responses to test

for hypothesized differences between groups for H, HE and HM variables scored as plus or minus. All of the human content variables, H, (H), Hf, (Hf), Hd, were subsumed under H. The H, HE and HM data were divided into 8 mutually exclusive conditions in which each Rorschach variable with a plus score for social appropriateness could or could not occur. The same 8 conditions were also prepared for each Rorschach variable with a minus score for social appropriateness (Table 3 lists the 16 conditions). Independent t-tests were computed for the conditions. It was predicted that students in the humanities group would significantly produce more appropriate (+) H, HE and HM scores than students in the science group. Contrary to expectation, no significant differences were obtained between groups on the mutually exclusive conditions involving H, HE and HM scores. Testing for diffences between combined scores for the groups was computed. Each condition in which a plus H, HE and HM response occurred (7 of the 8 conditions) was summed into a higher order value. A t-test was computed to test for differences between means of the higher order value. Students in the humanities group were found to significantly produce more appropriate H, HE and HM responses than students in the science group ($F=1.81$, 2-Tail Prob. .05). Also of interest is the finding that

Table 3 Mutually Exclusive Conditions for Mean Occurrences of H, HE, HM by Group Membership

CONDITIONS	SCIENCES	HUMANITIES
+ H BUT NOT HE OR HM	1.20	1.75
+ H AND HE ALONE	0.00	.05
+ H AND HM ALONE	3.16	3.58
+ H AND HE AND HM	.49	.27
+ BUT NOT H AND NOT HE OR HM	11.49	12.05**
+ BUT NOT H BUT HE	.11	.12
+ BUT NOT H BUT HM	.58	.89
+ BUT NOT H BUT HE AND HM	.07	.05
- H AND NOT HE OR HM	1.40	1.80
- H AND HE ALONE	.20	.09
- H AND HM ALONE	1.71	2.05
- H BUT HE AND HM	.13	.70
- BUT NOT H AND NOT HE OR HM	9.64	6.55
- BUT NOT H BUT HE	.18	.02
- BUT NOT H BUT HM	.64	.56
- BUT NOT H BUT HE AND HM	.09	.11
+ AND ALL H, HE, HM COMBINED	5.60	6.64*

Note: Findings reflect T-Tests. Two-tailed probability * $p < .05$. and ** at $p < .005$.

students representing the humanities group produced a significantly greater proportion of appropriate responses without H, HE or HM contents (F=2.38, 2-Tail Prob. .005) suggesting that their perceptions of their environment are more likely to be consensually validated in contrast to more idiosyncratic perceptions of the science students.

Group Differences Between the Rorschach and DPQ Intercorrelations

Pearson-product moment intercorrelations were computed between the Rorschach and the DPQ for the science students (Table 4). Significant correlations occurred between Human Face and Alienation (.38, $p < .01$) and Human Face and Control (-.38, $p < .01$) indicating that Hf may well address issues of interpersonal impulsivity and mistrust of others. Special case Human, (H), also significantly correlated with Absorption (.40, $p < .01$) suggesting that (H) reflects a connotative capacity to become lost in ones'subjective experiences rather than placing an emphasis on attending to external realtiy via denotative thought.

Rorschach and DPQ Pearson-product moment intercorrelations were computed for students in the humanities group (Table 5). Human face, Hf, negatively correlated with Achievement (-.44, $p < .01$) which

Table 4 Rorschach-DPQ Intercorrelations for Science Students (n=41)

	DPQ Scales																				
Rorschach Variables	Wb	WbAbr	Sp	Ac	Sc	Sr	SrAbr	Al	Ag	Con	Hav	Trd	Abs	Pa	Ne	Cst	Aslp	Unvt	Drin	Trin	Vrin	Invl
Response (+)	13	05	-16	11	02	09	09	-11	-22	03	00	-17	32	14	-02	-02	24	-15	-07	05	-15	-22
Response (-)	-12	-04	16	-10	-02	-10	-10	11	20	-03	02	17	-32	-13	00	03	-23	16	09	-05	15	22
Human Emotion	-20	-25	06	02	-30	04	-05	10	22	26	12	23	15	-05	22	21	-24	21	03	-08	-31	-20
Human Movement	-13	-12	30	08	01	06	03	06	19	16	25	-04	15	08	16	13	-05	34	03	07	-09	02
Whole Human	03	00	30	08	01	-17	-20	-09	02	27	28	-02	14	12	-08	16	-23	35	07	01	-28	-26
Whole Human (Special)	-16	-12	13	20	-01	31	28	06	08	11	08	-14	40*	16	28	06	30	09	-29	-06	09	26
Human Face	-01	04	10	-08	-02	01	-01	38*	22	-38*	-14	-17	08	04	24	-27	-02	26	28	24	06	28
Human Face (Special)	11	04	-33	02	-23	-12	-06	-29	-02	-04	-31	-08	-22	-20	-21	-18	-18	19	-03	27	09	-05
Human Detail	-25	-30	22	-06	-17	-02	-03	05	23	-05	-22	-29	06	-14	10	-26	21	-09	-06	-19	32	33
Cut Off Human Detail	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Note. Decimals omitted. "." indicates no coefficient could be computed.
*p <.01. **p.<.001.

Table 5 Rorschach-DPQ Intercorrelations for Humanities Students (n=43)

	DPQ Scales																					
Rorschach Variables	Wb	WbAbr	Sp	Ac	Sc	Sr	SrAbr	Al	Ag	Con	Hav	Trd	Abs	Pa	Na	Cst	Aslp	Unvt	Drin	Trin	Vrin	Invl
Response (+)	15	15	-28	16	06	-12	-11	-28	-21	30	11	16	-08	-03	-27	28	00	08	18	-07	-06	-07
Response (-)	-13	-12	30	-17	-07	12	11	27	19	-32	-11	-15	06	04	27	-29	01	-07	-18	04	07	08
Human Emotion	-06	02	-09	-18	07	20	22	06	07	-04	-08	01	12	-09	10	-11	-17	-11	-27	-02	-10	-11
Human Movement	04	19	12	10	-18	08	06	20	-02	-15	-21	-11	38*	13	15	-23	14	12	17	03	38*	45*
Whole Human	27	30	23	08	-10	-06	-02	08	-07	-07	-08	-04	32	26	07	-09	01	29	42*	11	18	28
Whole Human (Special)	23	30	18	-21	27	-16	-09	08	01	05	-01	06	29	23	-01	-01	04	-15	08	07	04	04
Human Face	03	02	17	00	04	12	13	06	-11	22	06	04	-16	04	03	24	-21	-08	04	-15	-21	-20
Human Face (Special)	04	14	17	-44*	20	08	15	00	-01	-23	-07	-16	-06	06	10	-17	-12	-38*	-21	-15	-08	-20
Human Detail	-13	-24	-26	-08	-20	-15	-24	00	-04	32	02	-21	-20	-37*	-22	07	-28	16	12	-05	-13	-03
Cut Off Human Detail	-19	-24	-21	00	15	32	32	-24	04	06	32	03	-21	-19	-01	19	-02	-19	-04	00	-04	-08

Note. Decimals omitted.
*p <.01. **p.<.001.

suggests Hf may also be related to a lack of ambition and drive to succeed. HM significantly correlated with Absorption (.38, $p < .01$) thus supporting previously cited research findings that HM reflects a capacity to be imaginative and emotionally responsive to ones internal realm of experience. HM may also be characterized by a tendency towards ruminative thought. Human detail, Hd, was found to negatively correlate with Positive Affectivity (-.37, $p < .01$). Positive Affectivity represents a higher order construct, derived from a factor analysis of the DPQ scales (Tellegen, 1982, p.10), with significant loadings from three DPQ scales, Wellbeing, Social Potency and Achievement. This negative relationship suggests that within the humanities group, Hd may indicate an unhappy, passive and unambitious predisposition towards the world at large.

Group Differences Between the Rorschach and PRF Intercorrelations

Rorschach and PRF Pearson-product moment intercorrelations were computed for the science students (Table 6). An unexpected negative correlation was obtained between Human Emotion, HE, and Affiliation (-.43, $p < .01$). This suggests HE may reflect a measure of interpersonal anxiety or a relative disinterest in interpersonal associations. Social Recognition showed a

Table 6 Rorschach-PRF Intercorrelations for Science Students (n=41)

	PRF Scales														
Rorschach Variables	Ac	Af	Ag	Au	Do	En	Ex	He	Im	Nu	Or	Pl	Sr	Un	In
Response (+)	12	09	-09	-07	-12	-01	03	03	-08	04	09	07	07	20	-08
Response (-)	-12	-08	06	06	12	01	-03	-02	08	-03	-10	-08	-06	-20	09
Human Emotion	06	-43*	22	13	22	10	-12	27	-23	-06	17	-20	28	-06	17
Human Movement	12	-17	22	-02	20	-02	19	17	-14	00	21	-14	36	09	20
Whole Human	19	-08	16	08	30	-02	02	28	-27	00	20	-11	33	17	03
Whole Human (Special)	33	-16	15	-08	09	09	25	02	-13	-05	22	-16	42*	34	04
Human Face	-18	-04	15	17	-05	-06	07	-16	30	20	-23	-01	-16	-02	61**
Human Face (Special)	-02	-09	-12	14	-19	-17	-17	-12	-08	-19	-28	07	-25	-37	02
Human Detail	-23	-10	16	21	-04	-12	23	-16	02	-32	02	31	05	-14	04
Cut Off Human Detail	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Note. Decimals omitted. "." indicates coefficient could not be computed.
*p <.01. **p.<.001.

significant association with (H) (.42, $p < .01$). This suggests that (H) may reflect a subject's attempt to be creative and produce an image which will be acceptable and will meet the demand of the task. A surprising finding occurred with the moderately strong correlation between Infrequency, which addresses a random or non-compliant response style, and Hf (.61, $p < .001$). This suggests that within the science group Hf may also reflect a capacity for erratic or inattentive thinking.

Rorschach and PRF Pearson-product moment intercorrelations were computed for students in the humanities group (Table 7). No significant associations occurred between H, HE and HM and traits which assess interpersonal attitudes. However, significant correlations did occur between human detail responses. A negative relationship occurred between (Hf) and Achievement -.40, $p < .01$), Endurance (-.38, $p < .01$) and a positive association with Impulsivity (.36, $p < .01$). This echoes the previous finding between Achievement_DPQ and (Hf) for the humanities students (-.44, $p < .01$) and lends further support to the interpretation that (Hf) may reflect a lack of ambition, a helter-skelter mode of thinking accompanied by avoidance of difficult tasks. From an interpersonal perspective this is suggestive of an impoverished mode of relating to others and even

Table 7 Rorschach-PRF Intercorrelations for Humanities Students (n=43)

	PRF Scales														
Rorschach Variables	Ac	Af	Ag	Au	Do	En	Ex	Ha	Im	Nu	Or	Pl	Sr	Un	In
Response (+)	19	08	-26	-07	-16	20	-40*	24	-27	01	34	-03	-09	15	-24
Response (-)	-20	-08	24	08	15	-23	40*	-26	26	-01	-36*	03	08	-15	26
Human Emotion	-01	03	-06	-04	-05	06	-08	-08	13	07	-04	-05	04	25	13
Human Movement	24	-01	-02	24	12	24	09	-35	03	-01	-15	06	00	23	02
Whole Human	35	11	-04	31	28	29	-06	-11	-10	09	-10	-07	-15	15	-19
Whole Human (Special)	17	32	10	-05	18	19	01	-08	08	16	19	-04	01	06	02
Human Face	02	-05	-07	-11	23	12	02	09	-22	18	11	-24	11	32	08
Human Face (Special)	-40*	12	07	-03	07	-38*	11	-23	36*	01	-28	18	16	-16	21
Human Detail	02	-29	00	07	-03	11	00	-01	-34	-14	07	-19	-16	24	-13
Cut Off Human Detail	00	-08	15	-18	-18	-01	-17	43*	-04	-07	18	-02	26	-09	-14

Note. Decimals omitted.
*p <.01. **p.<.001.

destabilized object relations. It should be noted that both Achievement scales on the PRF and DPQ correlated significantly within the science students (.80, $p < .001$) and the humanities students (.66, $p < .001$). Cut-off Human detail, Hdx, significantly correlated with Harmaviodance (.43, $p < .01$) which may suggest an attempt to maintain distance from interpersonal involvements. While response appropriateness showed no significant associations within the previous intercorrelations, three significant correlations occurred within the humanities group. Plus response appropriateness, indicating responses which are consensually validated, negatively correlated with Exhibition (-.40, $p < .01$). while positively correlating with minus response appropriateness (.40, $p < .01$). Order also negatively correlated with minus response appropriateness (-.36, $p < .01$). This supports a longstanding finding within Rorschach interpretation literature that percepts receiving scores for appropriateness reflect a capacity to impart a sense of order and reasonable relationship to the different aspects of the blots such that a percept can be easily verified and can be regularly perceived by many different people with different frames of reference.

Group Differences within the DPQ

A multivariate analysis of variance was computed to determine if the two groups of students significantly differed on the DPQ scores. Pillais, Hotellings and Wilks multivariate tests for significance indicated that the 11 primary DPQ scales failed to meet the assumptions of equal means between groups. Univariate F-tests were computed on the 11 primary scales (Table 8). The science group obtained significantly higher mean scores on Alienation (.038) and Traditionalism (.000). Alienation significantly correlated with Aggression (.44) and Negative Affectivity (.73) (Table 9). Negative Affectivity is a higher order factor analytically derived scale which significantly loads on three other DPQ scales, Stress Reaction, Aggression and Alienation (Tellegen, 1982, p.10). Traditionalism, on the other hand, is negatively associated with Aggression (-.37) and positively associated with Control (.40) and Constraint (.63). Like Negative Affectivity and Positive Affectivity, Constraint is the third higher order, factor analytically derived scale which is comprised of Control, Harmavoidance and Traditionalism (Tellegen, 1982, p.10). While these data point to two basic distinctions between both groups, on the basis of univariate F-tests, the data also raise the question of how to account for the

Table 8 Means and Standard Deviations for Humanities and Science Students on the DPQ

	Humanities		Science		
Scales	X	S.D.	X	S.D.	F
Wellbeing	18.1	4.9	16.4	5.8	1.98
Social Potency	14.0	6.6	11.4	5.3	4.25 *
Achievement	15.0	4.3	14.3	4.5	.62
Social Closeness	12.8	5.3	13.9	5.0	.93
Stress Reaction	12.8	6.3	11.7	6.9	.56
Alienation	1.9	2.1	3.3	3.6	4.44 *
Aggresssion	4.8	4.4	5.1	3.8	.08
Control	13.5	5.8	15.4	5.6	2.58
Harmavoidance	13.6	6.1	13.2	5.6	.08
Traditionalism	9.5	5.1	14.8	5.7	19.91 **
Absorption	25.7	6.2	20.8	7.7	11.02 **

Note: Significant differences between mean scores as determined by Univariate F tests are indicated by * $p < .05$. ** $p < .001$.

Table 9 DPQ Intercorrelations for Science Students (n=41) and Humanities Students (n=43)

DPQ Scales	DPQ Scales																				
	Wb	WbAbr	Sp	Ac	Sc	Sr	SrAbr	Al	Ag	Con	Hav	Trd	Abs	Pe	Ne	Cst	ASLP	UNVT	DRIN	TRIN	VRIN	INVL
Wellbeing		85**	40*	11	38*	-68**	-57**	-13	-35	03	-08	42*	39*	75**	-31	15	-03	38*	60**	12	-27	-14
Wellbeing (Abbreviated)	87**		31	18	20	-42*	-33	-01	-21	-04	-17	47**	52**	77**	-06	10	-00	31	45*	07	-12	02
Social Potency	21	36		05	40*	-06	05	37*	24	-32	-22	22	06	69**	31	-17	02	02	33	10	23	18
Achievement	15	15	15		-26	-07	-05	-18	-07	-19	-03	29	25	40*	11	09	06	24	18	08	-02	09
Social Closeness	52**	44*	23	-08		-18	-15	-03	-05	08	12	-01	00	41*	-22	10	-14	04	22	35	-06	-14
Stress Reaction	-65**	-51**	-31	-17	-23		95**	32	50**	-17	-05	-12	-16	-34	68**	-14	09	-44*	-43*	-06	43*	35
Stress Reaction (Abbreviated)	-56**	-42*	-32	-24	-16	97**		29	48**	-23	-02	-02*	-13	-21	72**	-11	05	-47**	-39*	-05	38*	25
Alienation	-22	-17	14	23	-21	20	12		46**	-27	-17	-15*	22	22	64**	-21	06	-05	09	-03	34	39*
Aggression	-53**	-48**	03	-31	-31	43*	44*	44*		-23	-47*	18	-04	-04	74**	-36*	04	-30	-24	-02	34	24
Constraint	-17	-01	17	32	-16	00	-08	-08	-22		45*	18	-21	-29	-41*	79**	-34	12	19	23	-31	-31
Harmavoidance	03	08	14	16	16	-04	-13	-13	-32	41*		-07	-39	-24	-45*	69*	-29	-01	-03	18	-14	-25
Traditionalism	19	27	07	12	-03	-15	-17	-02	-37*	40*	07		01	-43*	18	44*	-12	01	11	14	-04	-09
Absorption	25	23	14	26	-08	05	03	14	-01	-12	-24	-01		51**	23	-27	08	22	44*	07	-20	05
Positive Affectivity	76**	50**	31	54**	44*	-48**	-47**	13	-37*	-03	06	22	55**		18	-01	01	26	49**	29	-01	07
Negative Affectivity	-53**	-04*	13	06	-46*	69**	63**	73**	68**	-08	-25	-06	36	-15		-30	11	-31	-17	08	38*	35
Constraint	-02	12	12	47**	-04	-01	-12	10	-43*	83**	63*	63**	-14	16	-06		-35	09	12	28	-22	-30
Associative Slips	10	-08	-23	07	-07	13	22	10	14	-16	-34	-27	32	10	24	-28		-07	-11	-24	26	50**
Unlikely Virtues	34	35	40*	37*	18	-42*	-50**	29	-21	14	28	21	09	49**	-11	32	-14		43*	09	-22	-30
Desirable Response Inconsistency	32	24	00	15	19	-37	-40*	02	-41*	00	10	18	-10	20	-33	16	-15	49*		20	-19	-07
True Respons Inconsistency	18	30	-08	20	11	-09	-10	02	-15	-01	23	-08	-02	10	-12	12	-01	27	32		05	-04
Variable Response Inconsistency	-28	-25	-04	-12	-16	18	26	15	25	-10	-15	-17	-30	-29	19	-14	19	-40*	-40*	-15		80**
Invalidity	-08	-13	-08	10	-12	12	18	30	16	-14	-17	-07	-06	-02	27	-08	46*	10	-16	12	67**	

Note. Intercorrelations for Humanities Students appear above the diagonal; intercorrelations for Science Students appear below the diagonal. Decimals omitted. *p <.01. **p.<.001

divergent traits within the science group. The data suggest that a subgroup of science students may feel more mistrustful of others, easily slighted, vindictive and less comfortable in interpersonal situations while another subgroup espouses conservative values, cautious, planful and rational behaviors.

Alternatively, the multivariate analysis shows students in the humanities group produced significantly higher scores on Social Potency (.042) and Absorption (.001) than the science students (Table 8). From Table 9 it can be seen that Social Potency significantly correlates with Wellbeing (.40, $p < .01$), Social Closeness (.40, $p < .01$), Positive Affectivity (.69, $p < .001$) and Alienation (.37, $p < .01$). As noted previously, Positive Affectivity represents a higher order factor in which Wellbeing, Social Potency and Achievement have significant and primary factor loadings. Absorption also significantly correlated with Positive Affectivity (.51, $p < .001$) Wellbeing (.39, p .01) and Wellbeing Abbreviated (.52, $p < .001$). These data are somewhat conflictful in that they suggest students in the humanities are confident of their abilities to assume positions of leadership, they are happy and future oriented, emotionally responsive to their subjective

experiences and yet, are subject to feeling mistrustful and unfairly treated.

Group Differences Within the PRF

A multivariate analysis of variance was computed to determine if humanities students significantly differed from science students on the 15 different scales (Table 10). Pillais, Hotellings and Wilks multivariate tests for significance indicated that 2 of the 15 scales failed to meet the assumptions of equal means between groups for the PRF scales. The humanities students obtained significantly higher mean scores on Exhibition (.013) and Impulsivity (.053). Exhibition significantly correlated with Aggression (.55, $p < .001$), Dominance (.49, $p < .001$), Harmavoidance (.45, $p < .01$), Impulsivity (.38, $p < .01$), Play (.38, $p < .01$) and Social Recognition (.44, $p < .01$). Impulsivity significantly correlated with Endurance (-.48, $p < .001$), Exhibition (.38, $p < .01$), Order (-.43, $p < .01$) and Play (.41, $p < .01$) (Table 11). The higher scores on Exhibition and Impulsivity suggest the humanities students are more comfortable with being in the public eye and may be more carefree than the science students.

Table 10

Means and Standard Deviations for Humanities and Science Students on the PRF

Scales	Humanities X	Humanities S.D.	Science X	Science S.D.	F
Achievement	15.1	2.6	14.4	3.1	2.72
Affiliation	13.9	3.9	14.5	3.6	.51
Aggression	6.0	3.8	5.7	3.8	.13
Autonomy	10.5	3.7	9.4	3.5	2.07
Dominance	11.1	4.6	10.5	4.0	.41
Endurance	13.6	3.5	13.7	3.7	.02
Exhibition	11.9	4.3	9.6	4.2	6.37 *
Harmavoidance	7.3	4.5	7.9	4.2	.30
Impulsivity	10.8	3.9	9.1	4.2	3.84 *
Nurturance	13.7	3.4	14.3	3.3	.63
Order	9.3	4.4	9.6	5.0	.10
Play	11.4	3.6	12.2	3.4	1.09
Understanding	16.0	2.1	15.4	3.2	1.37
Infrequency	.7	1.3	.5	.9	.51

Note: Significant differences between mean scores as determined by univariate F tests are indicated by * $p < .05$.

Table 11 PRF Intercorrelations for Science Students (n=41) and Humanities Students (n=43)

PRF Scales	Ac	Af	Ag	Au	Do	En	Ex	Ha	Im	Nu	Or	Pl	Sr	Un	In
Achievement		03	-01	16	18	70**	-16	17	-20	14	14	-48**	-11	37*	-24
Affiliation	-07		-12	-50**	31	00	11	02	-01	70**	19	17	24	-08	-32
Aggression	-08	-40		-11	46**	-19	51**	-21	27	-34	10	19	28	-12	02
Autonomy	09	-40**	42*		-19	07	-24	-17	21	-26	-33	03	-40*	-04	25
Dominance	44*	10	26	27		03	49**	-07	04	26	02	-01	08	-08	-06
Endurance	60**	25	-28	-06	32		33	23	-48**	18	27	-41*	-14	43*	-12
Exhibition	-02	27	09	04	35	-09		45*	38*	04	-12	38*	44*	-20	-05
Harmavoidance	17	-27	-15	-20	24	-05	-14		55*	-02	23	-38*	05	00	-02
Impulsivity	-40*	06	16	10	-30	-33	33	-52**		03	-43*	41*	13	-23	18
Nurturance	27	71**	-37**	-26	24	48*	10	-18	-02		27	04	00	15	-14
Order	22	-04	06	-21	22	25	-16	44*	-55**	01		-10	04	27	-23
Play	-50**	27	01	-02	-18	-33	44**	-38*	39**	-06	-15		34	-43*	-01
Social Recognition	06	-07	03	-42**	14	-08	17	36	-27	-05	17	-09		06	-06
Understanding	47**	-02	31	20	22	20	07	11	-07	17	04	-28	01		-13
Infrequency	-09	-23	13	18	21	-08	10	-01	15	13	-25	-26	-02	13	

Note: Decimals omitted. Intercorrelations for Humanities students appear above the diagonal; Intercorrelations for Science students appear below the diagonal.
*p <.01. **p.<.001.

Group Differences From a Factor Analytic Perspective

While intercorrelation matrices and testing for differences between the means yielded substantial information about within and between group differences in interpersonal functioning, a factor analysis of the data was conducted in an effort to develop higher order constructs to assess group differences in the domain of interpersonal functioning.

Because of the overlap between some same named scales on the DPQ and the PRF, and in an effort to remain within acceptable criteria for introducing variables for factor analysis, Pearson-product moment intercorrelations were computed between the DPQ and the PRF scales for each group. The DPQ-PRF intercorrelation matrix for students in the sciences is found in Table 12. The DPQ-PRF intercorrelation matrix for students in the humanities is found in Table 13. While differences were observed between the groups on the DPQ-PRF intercorrelations, the general strength and direction of the intercorrelations remained stable for scales employed in the factor analysis.

Different trait scales were selected for the factor analysis on the basis of the following selection criteria: strong positive correlations between traits, polar traits as judged by strong negative correlations,

Table 12 PRF-DPQ Intercorrelations for Science Students (n=41)

PRF Scales	DPQ Scales Wb	WbAbr	Sp	Ac	Sc	Sr	SrAbr	Al	Ag	Con	Hav	Trd	Abs	Pa	Na	Cat	Aslp	Unvt	Drin	Trin	Vrin	Invl
Achievement	15	10	04	80**	-17	-19	-24	17	-26	25	02	18	33	47*	08	35	12	29	-01	07	-12	10
Affiliation	58**	51**	19	06	82**	-34	-27	-21	-44	-10	12	04	01	50**	-48**	03	-02	25	37	15	-18	-05
Aggression	-43*	-42*	04	-17	-21	39*	37*	41*	80**	-03	-25	-25	-06	-27	57**	-22	12	-09	-42*	-13	23	20
Autonomy	-16	-21	02	01	-50**	-09	-09	25	47*	-18	-34	-33	08	-12	27	-37*	04	-00	-03	-04	06	11
Dominance	17	09	50**	39*	04	-37*	-41*	35	05	25	11	14	08	48**	05	26	-17	40*	08	-11	08	02
Endurance	13	09	50**	39*	04	-23	-35	17	-32	25	21	24	24	43*	-04	43*	-01	31	34	21	-26	-00
Exhibition	19	11	54**	05	38*	-08	-08	19	15	-31	-07	-25	23	45*	08	-28	01	09	-11	-15	10	-01
Harmavoidance	-06	-01	27	13	-17	-04	-11	-02	-22	44*	71*	19	-25	-03	-13	56**	-33	14	-04	-09	-01	-21
Impulsivity	09	-02	-15	-42*	21	11	18	07	29	-88**	-42*	-33	08	-03	12	-76**	11	-24	-12	07	11	13
Nurturance	54**	51**	16	35	56**	-34	-33	02	-46*	-05	07	26	23	61**	-26	18	-15	39*	51**	34	-37*	-13
Order	-05	00	28	26	-07	-02	-10	-09	-34	64**	38*	38*	-13	08	-14	64**	-06	22	-05	05	02	09
Play	18	23	25	-30	30	-05	-03	-05	14	-26	-27	-16	04	08	08	-36*	-05	-03	03	01	00	-11
Social Recognition	-08	01	25	16	02	22	19	02	-07	40*	30	02	29	17	15	33	-01	05	-18	-27	01	-08
Understanding	08	01	06	19	-02	03	01	21	-07	-03	01	-18	38*	24	18	-02	14	-04	-14	-03	07	10
Infrequency	13	11	08	-05	-09	-07	-08	28	24	-17	-14	03	26	18	24	-14	08	20	03	09	-02	10

Note. Decimals omitted.
*p <.01. **p.<.001.

Table 13 PRF-DPQ Intercorrelations for Humanities Students (n=43)

	DPQ Scales																					
PRF Scales	Wb	WbAbr	Sp	Ac	Sc	Sr	SrAbr	Al	Ag	Con	Hav	Trd	Abs	Pa	Na	Cst	Aslp	Unvt	Drin	Trin	Vrin	Invl
Achievement	28	35	14	66**	-16	00	05	16	-04	05	11	37	15	36*	10	25	-02	25	22	26	14	19
Affiliation	66**	51**	42*	-16	80**	-38*	-32	-13	-16	13	04	23	20	59**	-24	20	-14	19	40*	47**	-03	-10
Aggression	-23	-14	42*	-04	06	44*	46*	31	77**	-34	-42*	16	-07	11	63**	-37*	22	-33	-17	-19	29	28
Autonomy	-05	04	-19	19	-56**	01	05	11	-16	-41*	-19	-32	30	-08	13	-41*	18	21	12	-29	-05	07
Dominance	32	22	85**	07	33	-07	03	33	26	-10	-18	18	10	58**	30	-06	-02	08	36*	08	07	15
Endurance	32	32	-14	52**	-17	-24	-23	-09	-20	34	27	41*	20	19	-20	46*	01	32	28	09	-18	-01
Exhibition	08	03	59**	-02	30	-02	-08	38*	41*	-32	-47**	00	05	36*	30	46*	18	-10	-07	06	25	29
Harmavoidance	-14	-26	-13	00	18	16	20	-06	-23	43*	82*	-02	-41*	-24	-22	61**	-27	07	05	15	-14	-23
Impulsivity	-03	04	20	00	06	18	19	23	21	-78**	-54**	-27	38*	25	39*	-74**	36*	-29	-17	-13	14	19
Nurturance	62**	49**	28	09	51**	-45*	-42*	-21	-34	15	-02	20	38*	55**	-32	16	-12	32	46**	42*	-33	-22
Order	11	14	-03	03	19	-03	-04	-19	01	42*	-01	35*	02	06	-12	32	-10	22	17	03	-16	-05
Play	09	12	11	-19	26	-09	-10	09	02	-36*	-41*	-05	24	19	14	-41*	09	-06	-02	-11	-01	-05
Social Recognition	-13	-08	20	02	49**	28	25	28	29	-13	08	-02	-08	18	23	02	-17	-27	-27	17	31	18
Understanding	00	09	-17	23	-13	03	-03	-05	01	19	-04	-03	11	-07	-10	02	-27	24	-02	-10	-02	11
Infrequency	-41	-30	-11	-09	-15	22	18	05	-04	-26	07	-36*	-13	-28	01	-26	43*	-09	-42*	-16	03	16

Note. Decimals omitted.
*p <.01. **p.<.001.

theoretically linked traits and clinical intuition. Affiliation_PRF, Aggression_PRF, Autonomy_PRF, Nurturance_PRF, Wellbeing_DPQ, Social Closeness_DPQ, Alienation_DPQ, Control_DPQ, Harmavoidance_DPQ, Absorption_DPQ and all of the previously mentioned Rorschach variables were subjected to an initial factor analysis. Using an anti-image correlation cutoff of .45 for exclusion from further analysis, Harmavoidance_DPQ was withdrawn from the variable sample. Hdx was not included in the analysis because it failed to meet cutoff criteria. Additionally, after trial rotations, (H), Hf, (Hf) and Hd were collasped into one composite variable due to low anti-image correlations. HM and H were summed into a separate composite variable because of their strong theoretical and statistical relationship. The reductions enhanced the representation of the data (KMO measure of sampling adequacy .69353) and also provided the added benefit of limiting the number of variables in the analysis.

Factor analysis, oblique, oblimin method (with iteration) yielded four factors. These factors accounted for 66.2 % of the total variance of the measures which were used in the analysis. The factors, their loadings, percent of variance accounted for and corresponding eigen values are reported in Table 14.

Table 14 Oblique Factors Derived From the DPQ, PRF and Rorschach Factor Analysis

Variables	Intimacy Factor I	Isolated/ Self-Absorbed/ Ruminative Factor II	Planful/ Human-Oriented Factor III	Against Others/ Part-Object-Oriented Factor IV
AF_PRF	.92870			
SC_DPQ	.90886			
NU_PRF	.75312			
WB_DPQ	.56841	.51192		
ABS_DPQ		.78639		
AU_PRF	-.60481	.60872		
CON_DPQ		-.53842	.49824	-.39516
HE			.79469	
H/HM			.69593	
AG_PRF				.78751
AL_DPQ				.71549
(H)/Hf/(Hf)/Hd				.40634
Eigen Value	3.29361	1.79523	1.50283	1.35182
% Total Variance	27.4	15.0	12.5	11.3

Based on cutoff criteria of ± .30 (Hair, et. al, 1975, p. 236) all of the variables within the factors were retained for further analysis. These factors represent different interpersonal orientations or attitudes towards people. Strong positive loadings of Affiliation_PRF (.93), Social Closeness_DPQ (.91), Nurturance_PRF (.75), a moderate loading on Wellbeing_DPQ (.57) and a moderate negative loading on Autonomy_PRF (-.60) occurs on Factor I and can be described as an Intimacy factor. Factor II includes a moderate positive loading on Wellbeing_DPQ (.51), strong positive loadings on Absorption_DPQ (.79), a moderate loading on Autonomy_PRF (.60), a moderate negative loading on Control_DPQ (-.54) and may be called an Isolated-Selfabsorbed /Ruminative factor. Factor III includes strong positive loadings on Human Emotion (.79), the composite Rorschach variable comprised of Human Content and Human Movement (.70), and a moderate positive loading on Control_DPQ (.50) and can be described as a Planful/Human Oriented dimension. Factor IV includes a mild negative loading on Control_DPQ (-.40), a mild positive loading on the composite Rorschach variables, (H), Hf, (Hf), and Hd (.41), and strong positive loadings on Aggression_PRF (.79) and Alienation_DPQ (.72) and can be described as an Against Others/Part Object dimension.

These results support the earlier contention that the Rorschach, DPQ and PRF variables do combine into a relationship of higher order factors which represent distinct aspects of interpersonal functioning and interpersonal attitudes. A check on the orthogonality of the factors yielded very low negative and low positive correlations between the factors (Table 15).

Table 15 Factor Correlation Matrix

	Factor I	Factor II	Factor III	Factor IV
Factor I	1.0000			
Factor II	.0473	1.0000		
Factor III	.0024	.0446	1.0000	
Factor IV	-.1723	.0878	.0770	1.0000

In order to ascertain whether these factors could discriminate between the two groups of students, two discriminant function analyses were performed. Discriminant analysis maximizes the ratio of the between group variability over within group variance. It involves computing a discriminant weight or constant that is multiplied by each variables' relative weight in the analysis and then summed to arrive at a discriminant score. This results in a single index or score for all variables for each subject. The discriminant for each subject is computed to obtain a group centroid against which each subject within a group is compared (Hair, et. al., p.85).

The first and most simple discriminant function, involved the inclusion of all of the variables from the factor analysis. A stepwise analysis of all of the variables from the factor analysis was conducted. Four variables remained in the discriminant function following the stepwise analysis on the basis of significant F-to-remove values (Table 16). Table 17 lists the discriminant function correlation coefficients for each variable consididered in the discriminant function analysis.

Table 16 Variables Remaining in the Discriminant Analysis Following Stepwise Removal of Nonsignificant Variables

Variables	F Value	Significance
Absorption	11.43	.0011
Human Emotion	9.30	.0002
Alienation	8.10	.0001
Nurturance	7.79	.0000

Table 17 Discriminant Function Correlation Coefficients Ordered by Size of Correlation Within the Function

Variables	Correlation Coefficients
Absorption	-.59441
Human Emotion	.39021
Alienation	.36459
Nurturance	.19497
Autonomy	-.17592
Control	.16835
Social Closeness	.16637
Wellbeing	-.15008
Aggression	.12523
Affiliation	.06509
H/HM	.00997
(H)/Hf/(Hf)/Hd	.00767

Table 18 lists the classification function coefficients for the four variables which comprised the discriminant function. The four variables that were selected as the discriminant function correctly classified 65.9% of the science students and 79.1% of the humanities student (Table 19).

Table 18 Discriminant Analysis Classification Function Coefficients

Variables	Science	Humanities
Nurturance	1.175681	.988582
Alienation	.359378	.149262
Absorption	.207647	.365963
Human Emotion	13.192433	2.611980

Table 19 Classification Table for Discriminant Analysis

Scale Loadings

Actual Group	No. of Cases	Predicted Group Membership 1	2
Science	41	27	14
		65.9%	34.1%
Humanities	43	9	34
		20.9%	79.1%

Percent of "grouped" cases correctly classified: 72.62%

The second discriminant analysis was performed to further examine the predictive power of using composite loading values for each factor. Factor loadings were saved from the factor analysis and computed for each individual. A stepwise analysis of the factors removed Factor I ($F=.6328$, $p < .4238$), Factor III ($F=.7652$, $p < .3843$) and Factor IV ($F=1.422$, $p < .2364$) from further analysis on the basis of nonsignificant F values. Factor II remained in the analysis on the basis of a significant F value ($F=12.60$, $p < .0006$). Factor II was comprised of

Wellbeing_DPQ, Absorption_DPQ, Autonomy_PRF and Control_DPQ and was labelled the Isolated/Selfabsorbed /Ruminative factor. The classification table (Table 20) indicates that Factor II correctly classified science students 63.4% of the time and correctly classified humanities students 67.4% of the time. The percent of grouped cases correctly classified was 65.48% . These modest findings indicate that the factor loadings correctly classified students 15.48% better than chance. This analysis clearly points to the factor loading values as being the weaker of the two discriminant measures. The factor loadings reflect a second order computation or transformation contrasted to the initial computation in the first analysis. Too, the second analysis was inconsistent with the first as it used different variables with different discriminant values. This indicates considerable instability in the data sample. Given the discrepancy between the analyses, the initial analysis is most trustworthy and the second discriminant analysis is inherently more questionable in its psychometric value.

Table 20 Classification Table for Discriminant Analysis

Factor Loadings			
Actual Group	No. of Cases	Predicted Group Membership 1	2
Science	41	26	15
		63.4%	35.6%
Humanities	43	14	29
		32.6%	67.4%

Percent of "grouped" cases correctly classified: 65.48%

CHAPTER IV

DISCUSSION

This study investigated the longstanding stereotype which purports that students who pursue the physical sciences courses of study and later begin work in science occupations have mental lives that are not as peopled on both a manifest and unconscious level as students pursuing predominant courses of study in the arts and humanities. Previous research by Roe (1951), Rieger (1949), and Kaback (1946) have all described differences in interpersonal functioning between science and non-science students. While some of the questions raised in this study examined the stereotype which is largely addressed in the between groups studies, this study also focused on within group differences in hopes of attaining a more complete understanding of how these bright and talented students think and feel about others.

This study also examined the relationships between the Rorschach, the DPQ and the PRF. In the context of this preliminary investigation on interpersonal differences, it was hoped the study would further elaborate the meanings of the Human content scores, H, (H), Hf, (Hf), Hd and Hdx, and the Imaginal Aspects, HE and HM by examining the relationships of these Rorschach

variables with selected PRF and DPQ trait scales that measure various aspects of interpersonal functioning. The basic question which was posed addressed the pattern of the relationships between the above named measures. From this issue rose the more specific question of whether there is a single variable which distinguishes between the interpersonal functioning of the humanities and science groups, or whether there are multiple variables which discriminate the two groups. While the results variously supported some expectations, one of the significant findings from this study is that the data do not support the stereotype which states that students in the physical sciences are less interpersonally oriented than students in the humanities. Another significant finding centered around the observation that the clinical utility of the Rorschach is significantly improved upon when sign approach interpretations of Rorschach scorings are eschewed in favor of more contextual interpretations which acknowledge individual and group differences in the meanings of the scores. Even given this caution, some differences in the pattern of interpersonal functioning were found between the science and humanities groups. In order to address the differences between the two groups, an examination of the meanings of the Rorschach variables will be discussed first.

Rorschach Variables and Their Relative Meanings

As noted in previous sections, the grouped intercorrelations of Rorschach variables produced unexpected findings with the failure of whole H and HE and HM to significantly correlate with non-whole H content responses. The data failed to support the expected associations between all of the Rorschach variables and underscores the thinking that association within a specific category, i.e., human content does not necessarily imply that all of the scores will be related. The observed statistical separation between H, HM and HE and non-whole human responses divides the variables into two groups of seemingly unrelated variables. Several possible explanations may account for this lack of a relationship. From a purely statistical perspective, the lack of significant relationships between the Rorschach variables may be due to the relative low frequencies of many of the variables within the group samples. This line of reasoning seems less than adequate since the Rorschach variables did show a relationship to other DPQ and PRF scales. However, another plausible answer lies in the thinking of object relations theorists who assert that production of the different non-whole human responses, especially to the exclusion of H in a Rorschach record, indicates facets of interpersonal

functioning which reflect a moving away from people because of disturbances in internalized mental representations of others (Mayman, 1967).

Turning to group differences between the Rorschach intercorrelations, the science students demonstrated a consistent pattern of significant correlations between HE and HM with H and (H). These strong relationships suggest that the science students, as a group, have an active, highly ideational, emotional and intense fantasy life. The frequency with which science students produced HE was twice that of the humanities students; they also produced significantly more HM and Hd responses than the humanities students. The significant negative relationship between (H) and (Hf) is noteworthy as both scores reflect quasi-human responses. This negative correlation suggests that the two variables assess different aspects of interpersonal functioning within the science students group. These seemingly related variables reflect different levels and kinds of fantasies about people. The recent thinking of object relations theorists suggests that quasi-human responses are indicative of fantasies of moving away from people. Further speculation about this difference then suggests that (H) may reflect a better capacity than (Hf) to manage or structure interpersonal anxiety, although, it

remains an indicator of a tendency to move away from others. In those individuals within the science group who are able to sustain a fantasy life that is peopled with whole, albeit distantiated human percepts, one would observe production of fewer quasi-human face responses and quite possibly, less interpersonal anxiety. Science students who produced more (Hf) than their within group peers thus seem to have a mental life that is peopled with more anxiety provoking part-object representations of others which suggests that interpersonal situations are more ego-dystonic. The significant difference in production of Hd is suggestive of further avoidance of whole human fantasies in preference for more manageable part-object, less threatening fantasies about people. It would be expected that an overproduction of Hd responses would reflect a cognitive and emotional orientation that does take note of anxiety provoking wholes. Control and order of psychic resources is consequently maximized by the reduction of anxiety provoking whole object images into part-objects.

Although the intercorrelations between HE and H and HE and HM are quite low in comparison to those of the science students, the humanities students also appear to have an active fantasy life as judged by their productions of H and HM. It is noteworthy that

humanities students' productions of HE did not show a strong association with H but they significantly produced more H than the science group. This difference may, in part, be due to the fact that the human percepts of the humanities students are less frequently produced without a fantasied emotion, HE, and consequently the percepts do not appear to be as emotionally charged as the HE responses of the science students. The analysis of the differences between the socially appropriate summation scores of all H content scores, HE and HM also suggest differences in the mental life of the science and humanities students. Results from this analysis found the humanities group to significantly produce more socially appropriate H content, HE and HM responses than the science students. Additionally, the science group produced significantly more inappropriate responses which contained no H content or HE or HM.

When these data are explained from an object relations perspective, it is suggested that the humanities students may have a mental life that is peopled with representations of others that are primarily benevolent. This suggests that students in the humanities group had caretakers early in life that were emotionally responsive to them and were not overly frustrating. This also suggests that the humanities

students have greater access to conflict-free spheres of funtioning in which the ego is not threatened thus allowing more ego resources to mediate conflicts which arise. On the other hand, these data suggest that the science students may be more vulnerable to the press of their emotions than the humanities students. The humanities seem better able to modulate their emotions through resources which may not be easily accessible to science students producing higher HE responses. It may also indicate that students whose mental lives are populated by emotionally provocative mental images of people may prefer to relate to others on a fantasy level rather than a more direct level. It seems that the significant production of H within the humanities group indicates that fantasies about people and mental representations of significant others may be less conflictful than within the science group.

The significant differences between the appropriate scores for summed Human content, HE, HM and no Human content, or HE or HM also points to substantial variations in the consensual quality of thought within the groups. This finding may be accounted for by several perspectives. It is generally thought that inappropriate scores on the Rorschach indicates at best a capacity for creative thought. Because it is not unusual for creative

and intelligent individuals to think somewhat differently from less intelligent and less creative peers and since social appropriate scores on the Rorschach are based on consensually validatd perceptions, it becomes important to consider the population before addressing the meaning of the idiosyncratic thinking that is accorded a minus score for appropriateness. Given this condition, certain degrees of freedom could be considered prior to interpretation to account for differences. However, it would be generally expected that what is consensually perceived cuts across supposed boundaries of intelligence and creativity. The expectation would then remain for any population to meet certain basic criteria for appropriateness of percepts. Inappropriate scores may also result from cognitive distortions and misperceptions which are characteristic of more severe disturbances in psychological functioning. It is in this realm of cognition that idiosyncratic and distorted thinking takes on a more descriptive and clinically significant role. Examination of the summed H, HE and HM frequencies for the groups and the significant difference in the production of all inappropriate responses indicates that the science group, on the whole, responded with more idiosyncratic and inaccurate perceptions. A number of

reasons may account for the differences. First, it may be that some of the science students may have attempted to integrate too many aspects of the blot characteristics and produced a percept that was inadequately integrated. An overincorporative mode of cognition is commonly seen in individuals who feel pressed to account for all facets of a given perception. Another possible reason for the increase in inappropriate scores may center around the obverse of the overincorporative problem. Some individuals have a cognitive style that focuses on breaking a complex whole into its constituent parts. This mode of cognition, like the first, often produces percepts which may be idiosyncratic and may not be consensually validated. Both cognitive styles are represented in inidviduals who experience considerably more anxiety in unstructured and ambiguous situations. These cognitive styles seem to characterize some of the individuals in the science group. However, an assessment of the validity of this speculative statement would require an examination of the Cognitive Complexity scores from the Burstein-Loucks scoring system (1988). These scores were not addressed in this study. Notwithstanding these speculations, it seems apparent from the data that some students in the science group experience more anxiety and are also more prone to a

range of disturbances in the quality of thought in contrast to students in the humanities group. This also calls the representational quality of the mental images of others into question. If their human percepts are representative images of their internal world, as has been asserted, some of the science students may be described as experiencing more interpersonal anxiety than some of the students in the humanities group. The reader is reminded that these findings principally reflect group differences.

Meaningful Relationships Between the DPQ, PRF and Rorschach Variables by Group Affiliation

Not all of the Rorschach variables significantly related to trait scales on the DPQ or PRF. Scales which did significantly correlate with the Rorschach variables differed in the relative meanings for each group of students. This finding reiterates the call for personality researchers and Rorschach clinicians to interpret meaningful Rorschach relationships within a context of relationships with other variables. This study very clearly indicates that it is a misconception on the part of the Rorschach clinician who simply attributes a specific meaning to a particular Rorschach variable without considering three central interpretive components. First, it is essential to consider the

social appropriateness of the score. The meaning for a Human Emotion response that has received a social appropriateness score of plus (+) will mean something quite different than a Human Emotion response which receives an inappropriate score of minus (-). Secondly, it is important to consider the population to which an individual belongs before interpretations are made. For example, Human Movement or Human Emotion scores will mean something entirely different for someone diagnosed as paranoid schizophrenic than for someone evidencing neurotic level conflicts. Third, it is ill-advised to interpret Rorschach scores apart from their interrelationships with other Rorschach variables as many variables share are interrelated in meanings. For example, a comprehensive assessment of cognition on the Rorschach requires that the clinician examine the interrelationships of the cognitive complexity variables, the social appropriateness of responses, content scores, special scorings and other variables before formulating a judgment. While this interpretive process is more time consuming and theoretically demanding, these complex relationships between the Rorschach variables provide a more rich clinicial picture of an individual's mental life.

Three Rorschach variables in this study significantly correlated with several DPQ and PRF traits and provided additional information about interpersonal functioning within the science students. The positive relationship between Hf and Alienation suggests that mental representations of others, as represented by Hf, may be closely aligned with feelings of betrayal, mistrust and mistreatment from others. The negative relationship with Control suggests Hf is also related to impulsivity and carelessness. This is further reflected by the association with the Infrequency score in the PRF. Generalized to interpersonal relationships, Hf seems to identify some individuals within the science group who feel that people may hurt them. The positive relationship between (H) and Absorption is an interesting finding in light of the thinking of Rorschach clinicians who suggest that quasi-human responses indicate a moving away from people. This relationship suggests that (H) may reflect an internal world that is subject to the press of emotions such that representations of others take the form of part fantasy part human objects. It may be that some of the science students are preoccupied with their own subjective experience to the extent that little room is left in their mental economy for others. (H) can be seen to not only indicate a moving away from others

but also a moving towards selfabsorption and fantasy. The negative relationship between HE and Affiliation in the PRF seems to indicate that for some science students, fantasied emotions involving people are largely unhappy and unfriendly.

Within the humanities group, HM is positively associated with Absorption thus confirming earlier interpretations of HM as indicating an imaginative capacity accompanied by the ability to think reflectively and process emotional concerns through ideation rather than uninhibited action. As is the case with the science students, a capacity for rumination also characterizes students in the humanities. The findings from DPQ comparisons between groups further describe students in the humanities as socially potent individuals who are desirous of opportunities to lead and influence the lives of others. These students possess general feelings of wellbeing and selfacceptance and seem to meet needs for affiliation through indirect channels provided by their academic endeavors. Students in the science group in contrast, seem to feel more alienated and given to more mistrustful feelings of the intentions of others than the humanities students. This result may partially be explained by the fact that most of the students in the study are young adults who have just emerged from

adolescence or are in the process of making the transition into young adulthood. Any feelings of alienation might be amplified by this transition. These students were self-described on the DPQ as having a more traditional value system than the students in the humanities group.

Another finding which supports the caution of avoiding generalizations of meaning between groups in Rorschach content responses can be found in the relationships of several DPQ and PRF variables with (Hf). Whereas (Hf) tends to reflect alienation and interpersonal withdrawal in the science group, (Hf) addresses issues of achievement within the humanities group. The negative associations with Achievement and Endurance on the PRF and Achievement on the DPQ indicate differences in the psychological meaning of (Hf) for each group. Within the humanities group, achievement and ambition seem to be inextricably linked to a fantasy life that is peopled. To achieve means being involved with people and not achieving is equivalent to withdrawal into a more interpersonally restricted life of part-objects.

Explication of Factor Analysis and Discriminant Analysis Findings

It was earlier noted that factor analysis could help explain the relationship between selected DPQ, PRF Rorschach scores by summarizing the data into higher order constructs of interpersonal functioning. Results from the factor analyses and discriminant function analyses warrant caution in assigning significant meanings to the findings.

The predictions that H, HE and HM would combine with selected DPQ and PRF trait scales to produce higher order factors of attitudes towards people was only modestly bourne out in the study. Two factors were derived from the analysis in which all of the Rorschach scoring variables loaded. The Rorschach variables were combined into two higher order variables in an effort to improve the likelihood of loading with the DPQ and PRF traits. Factors I and II were comprised of PRF and DPQ traits and accounted for most of the sample variance. Although the Rorschach variables combined with some PRF and DPQ variables on Factors III and IV, these factors did not account for much of the sample variance.

Several explanations can be offered to describe the less than robust performance of the Rorschach variables' failure to account for a large proportion of the sample

variance. The DPQ and the PRF variables employed in the factor analysis represent a larger subset of the possible variables which could have been used in the factor analysis compared to the proportion of the Rorschach variables which were included versus those not used in the study. As a result of the proportional difference of variables used from each measure, it is evident that the DPQ and PRF variables have a greater statistical chance of accounting for a greater share of the sample variance. The factor analysis and subsequent analyses then become the case of a few Rorschach variables against many DPQ and PRF variables. Secondly the DPQ and PRF were both constructed along similar psychometric grounds which includes orthogonal relationships between the different traits. These measures also represent interval level data while the Rorschach does not. The Rorschach was not psychometrically derived and further exhibits peculiar metric properties when subjected to psychometrically sophisticated analyses which assume interval level data. Because of these reasons, both factor analysis structures can be described as relatively unstable, especially the second factor analysis in which factor loading values were computed and then subjected to a discriminant analysis. The results from the second factor analysis and discriminant analysis should be more cautiously

interpreted than the first factor and discriminant analysis. The second factor and discriminant analysis failed to represent a similar factor space as the first thus indicating a great degree of heterogeneity within the data and a highly unstable and inconsistent factor space.

The reader is cautioned against forming an erroneous judgment about the Rorschach on the merits of the findings from these factor and discriminant analyses. Without taking account of the previously noted considerations, some readers might come to see the Rorschach as an inadequate measure of interpersonal functioning. It should be remenbered that only a few variables out of many possible Rorschach variables were employed in the study.

Despite the cautions against assigning too much value to the factor and discriminant analyses results, the data suggest that the first factor analysis and discriminant analysis are more stable and informative than the latter, consequently, only the first analyses will be discussed in any detail. The first factor analysis accounted for two-thirds of the sample variance for both groups. This result represents only a mediocre explanation of the sample variance and further reflects the instability of the data sample.

In the first factor analysis, the view that H and HM play a role in assessing the capacity to internalize and plan was partially corroborated. It further supports the thinking of object relations theorists who suggest that (H), Hf, (Hf) and Hd address general issues of moving away from people. The factors do indicate some subjects emphasize affiliation in their attitudes and needs while other students seem to be preoccupied with their own subjective experiences and seemingly are quite comfortable in isolating themselves in their own internal world.

Results from the first discriminant analysis pointed to a relatively good capacity to classify humanities students on the basis of the following four variables: Absorption, Nurturance, Human Emotion and Alienation. Weightings for the variables indicate the humanities students scored significantly higher on Absorption whereas science students scored significantly higher on Alienation and Human Emotion. Scores on Nurturance were not significnatly different between the groups initially, although it significantly combined with the other variables within the discriminant function. These results suggest that the humanities students are quite willing to become engrossed in their own subjective experiences. The fascination with self and internal

thought may occur to the point of avoiding others, not out of fear of injury or mistreatment, as may be the case with some science students, but out of a genuine interest and curiosity about their subjective experiences.

Further Cautions About the Study

It should be stated that the findings of this study should not be generalized to the population at large. Beyond this caution, the reader is reminded that the data did not represent a homogeneous sample. The science sample reflected greater variance than the humanities sample. This may be accounted for by selection criteria. Future studies could improve the sample selection process if subjects were more closely identified with a specific academic interest. While this was the case with many of the science students, some of the students were unsure about their field of interest. The fact that the science group was composed of some students pursuing pre-med tracks most probably contributed to the heterogeneity of the sample.

Conclusions

There are several primary points to be learned from this preliminary study on interpersonal differences between students in humanities and sciences. First, the interpretive meanings of the Rorschach variables employed

in the study represent complex, multifaceted dimensions of personality that are not easily labeled as advocates for sign approach interpretation of variables espouse. Rather, it has been demonstrated that these Human Content, Human Movement and Human Emotion variables have multiple meanings which are dependent three central considerations: the population sampled, the social appropriateness of the score and the interrelationship of the variable or variables in question with other variables. In short, the Rorschach variables have different meanings and they can not easily be explained by the "signs" approach method of interpretation as advocated by some Rorschach clinicians.

There are, however, some general meanings which cut across group differences which can be generalized to populations at large. For example, HM has been repeatedly demonstrated by numerous empirical studies to indicate an internalized capacity for fantasy. This capacity for fantasy is commonly found in most people in varying degrees and qualitative levels. The caution to avoid sweeping generalizations comes in to play when clinicians and researchers alike begin to speak specifically about the multiple meanings of HM. In the case of this particular study, some statements can be made about the meaning of HM. Whereas HM has been

ascribed a number of different meanings, the data in this study point to definite relationships between HM and ideation rather than specificaly associating HM with measures of interpersonal functioning.

Secondly, this study failed to support the expectation that students in the humanities are more people oriented than science students. While there do seem to be some general differences which separate the groups on the basis of object relational differences, the differences can not be identified with the simplistic "people oriented" descriptor. The study does find that humanities students are given to greater selfabsorption that is willful, autonomous and purposeful and seemingly egosyntonic. This suggests that a premium is placed by these individuals on thinking. This is not at all surprising given their high achieving academic status. While the premium is placed on thinking and achievement, it seems quite probable that academic pursuits provide one avenue of relating to others. The science students are somewhat different from the humanities students in that they seem to experience greater emotional discomfort in their thinking mode. This was reflected in the production of negatively valent HE responses, the significant difference in overall minus appropriate response scores, compared to the humanities group, and

the human content data suggested a moving away from people because of interpersonal anxiety.

An over-arching finding of this study centers around the notion that there is no "g" factor of interpersonal functioning in people. The data point to the notion that there are many different ways in which people interrelate and it is very difficult to assign individual's to a group on the basis of a simple notion of whether one is people oriented or not.

This research effort leaves a number of questions to be explored in future studies. The group differences in socially appropriate scores on H, HE and HM points to more idiosyncratic thinking in the science students. While it is beyond the scope of this study, an examination of the relationships between H content scores, HE and HM and the DPQ and PRF traits could provide additional insight into the meanings of the Rorschach variables. In addressing the meaning of both minus and plus HM responses, it would be interesting to look at the role of the other Imaginal Aspects scores from Burstein and Loucks new Rorschach scoring system. As these two groups of students are highly ideational, future research could address the relationship between the use of Color and Human Emotion to more adequately explore the relationship between fantasied emotion and

affect. Future research could also more explicitly address the quality of cognition between the two groups by examining additional Rorschach variables that would provide a more comprehensive perspective on the issue of why science students produced significantly more inappropriate responses on the Rorschach.

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APPENDIXES

06/30/02

Scores on the DFQ span what range?

Might the higher traditionalism for science suggest the more "rigid rules" of their discipline

Humanities produced more H than science ⇒ more integrated?
If humans have 2 basic ways of structuring (biological/logical vs relationship/mother-infant) then ~~they~~ humanities would be on the relationship side?

Appendix A

Trait Summaries of Eleven Primary DPQ Scale

Scale	High Scorers	Low Scores
Wellbeing	Has a happy, cheerful disposition; feels good about self; sees a bright future ahead; lives an exciting, active life.	Reports few experiences of joy and excitement; is seldom really happy.
Social Potency	Is forceful and decisive; is persuasive and likes to influence others; enjoys or would enjoy leadership roles; takes charge of and likes to be noticed at social events.	Prefers others to take charge and make decisions; does not like to persuade others; does not aspire to leadership; does not enjoy being the center of attention.
Achievement	Works hard; likes long hours; enjoys demanding projects; persists where others give up; puts work and accomplishment before many other things; is a perfectionist.	Does not like to work harder than is strictly necessary; avoids very demanding projects sees no point in persisting when success is unlikely; is not terribly ambitious or a perfectionist.
Social Closeness	Is sociable, likes people; takes pleasure in, and values, close interpersonal ties; is warm and affectionate; turns to others for comfort and help.	Likes being alone; does not mind pulling up roots; is aloof and distant; prefers to work problems out on her (his) own.
Stress Reaction	Is nervous; feels vulnerable and is sensitive; is prone to worry; is easily upset and irritable; has changing moods; can feel miserable without reason; is troubled by guilt feelings.	Can put fears and worries out of her (his) mind; quickly gets over upsetting experience is not troubled by emotional turmoil or guilt feelings.
Alienation	Is a victim of bad luck; feels mistreated; is a target of false rumors; believes that others wish her (him) harm; feels betrayed and used by "friends".	Does not see self as victim; feels treated fairly; does not feel taken advantage of.

Appendix A (Continued)

Content Summaries of Selected DPQ Scales

Scale	High Scorers	Low Scores
Aggression	Will hurt others for own advantage; is physically aggressive; is vindictive; likes to frighten and discomfit others; likes violent scenes.	Will not take advantage of others; is not violent; would rather turn the other cheek than seek revenge; does not enjoy others' misfortunes; does not like to witness physical aggression.
Control	Is reflective; is cautious, careful, plodding; is rational and sensible; likes to anticipate events; likes to plan her (his) activities.	Is impulsive and spontaneous; can be reckless and careless; prefers to "play things by ear".
Harmavoidance	Does not enjoy the excitement of adventure and danger; prefers safer activities even if they are tedious or aggravating.	Goes for risky stunts and adventures; may enjoy the excitement of a dangerous emergency or disaster; might expose self to possible attack or injury.
Traditionalism	Endorses high moral standards; supports religious values and institutions; condemns selfish disregard of others; deplores permissiveness; endorses strict child rearing practices; values propriety and a good reputation.	Does not belabor the importance of high morals; considers traditional religion outdated;questions established authority; sees merit in self-fishness; values rebelliousness and freedom of expression does not believe in punitive discipline; is not very prudish.

Appendix A (Continued)

Content Summaries of Selected DPQ Scales

Scale	High Scorers	Low Scores
Absorption	Is emotionally responsive to engaging sights and sounds; is readily captured by entrancing stimuli; thinks in images and has synaesthetic and other "crossmodal" experiences; can summon and become absorbed in vivid and compelling recollections and imaginings; experiences episodes of expanded (extrasensory, mystical) awareness and other altered states.	Is not easily caught up in sensory and imaginative experiences; does not readily relinquish a realistic frame of reference.

Note: Each scale description is based on a confirmed-perspective cluster analysis of a occurrence matrix derived from item-content sortings by 9-12 judges. These scale descriptions were copied from Tellegen's DPQ revised manual pp. 5-6, 1982.

Appendix B

Trait Summaries of PRF Scales

Scale	High Scorers	Defining Trait Adjectives
Achievement	Aspires to accomplish difficult tasks; maintains high standards and is willing to work toward distant goals; responds positively to competition; willing to put forth effort to attain excellence.	meek, self-accusing, self-blaming, obsequious, self-belittling, surrendering, resigned, self-critical, apologizing, subservient, obedient, yielding, humble, self-subordinating.
Affiliation	Enjoys being with friends and people in general; accepts people readily; makes efforts to win friendships and maintain associations with people.	neighborly, loyal, warm, amicable, good-natured, friendly, companionable, affable, cooperative, gregarious, hospitable, sociable, affiliative, good-willed, genial.
Aggression	Enjoys combat and argument; easily annoyed; sometimes willing to hurt people to get his way; may seek to "get even" with people whom he perceives as having harmed him.	aggressive, quarrelsome, irritable, argumentative, threatening, attacking, antagonistic, pushy, blunt, hot-tempered, easily-angered, hostile, revengeful, belligerent, retaliative.
Autonomy	Tries to break away from restraints, confinement, or restrictions of any kind; enjoys being unattached, free, not tied to people, places, or obligations; may be rebellious when faced with restraints.	unmanageable, free, self-reliant, independent, autonomous, rebellious, unconstrained, individualistic, ungovernable, self-determined, non-conforming, uncompliant, undominated, resistant, lone-wolf.
Dominance	Attempts to control his environment, and to influence or direct other people; expresses opinions forcefully; enjoys the role of leader and may assume it spontaneously.	governing, controlling, commanding, domineering, influential, persuasive, forceful, ascendant, leading, directing, dominant, assertive, authoritative, powerful, supervising.

Appendix B (Continued)

Scale	High Scorers	Defining Trait Adjectives
Endurance	Willing to work long hours; doesn't give up quickly on a problem; perserving, even in the face of great difficulty; patient and unrelenting in his work habits.	persistent, determined, steadfast, enduring, unfaltering, perserving, unremitting, relentless, tireless, dogged, energetic, has stamina, sturdy, zealous, durable.
Exhibition	Wants to be the center of attention; enjoys having an audience; engages in behavior which wins the notice of others; may enjoy being dramatic or witty.	colorful, entertaining, unusual spellbinding, exhibitionistic, conspicuous, noticeable, expressive, ostentatious, immodest, demonstrative, flashy dramatic, pretentious, showy.
Harmavoidance	Does not enjoy exciting activities, especially if danger is involved; avoids risk of bodily harm; seeks to maximize personal safety.	fearful, withdraws from danger, self-protecting, pain-avoidant, careful, cautious, seeks safety timorous, apprehensive, precautionary, unadventurous, avoi risks, attentive to danger, stays out of harm's way, vigilant.
Impulsivity	Tends to act on the "spur of the moment" and without deliberation; gives vent readily to feelings and wishes; speaks freely; may be volatile in emotional expression.	hasty, rash, unihibited, spontaneous, reckless, irrepressible, quick-thinking, mercurial, impatient, incautious, hurried, impulsive, foolhardy, excitable, impetuous.
Nurturance	Gives sympathy and comfort; assists others whenever possible, interested in caring for children, the disabled, or the infirm; offers a "helping hand" to those in need; readily performs favors for others.	sympathetic, paternal, helpful, benevolent, encouraging, caring, protective, comforting, maternal, supporting, aiding, ministering, consoling, charitable, assisting.

Appendix B (Continued)

Scale	High Scorers	Defining Trait Adjectives
Order	Concerned for keeping personal effects and surroundings neat and organized; dislikes clutter, confusion, lack of organization, interested in developing methods for keeping records methodically organized.	neat, organized, tidy, planfu systematic, well-ordered, disciplined, prompt, clean, orderly, methodical, schedule unvarying, deliberate, consistent.
Play	Does many things "just for fun"; spends a good deal of the time participating in games, sports, social activities, and other amusements; enjoys jokes and funny stories; maintains a light-hearted, easy-going attitude toward life.	playful, jovial, jolly, merry pleasure-seeking, laughter-loving, joking, frivolous, fun-loving, prankish, sportiv mirthful, gleeful, carefree.
Social Recognition	Desires to be held in high esteem by acquaintances; concerned about reputation and what other people think of him; works for the approval and recognition of others.	approval seeking, proper, seeks recognition, courterous, makes good impression, accomadating, seeks respectability, seeks admiration, obliging, agreeable, socially sensitive desirous of credit, behaves appropriately, wellbehaved, socially proper.
Understanding	Wants to understand many areas of knowledge; values synthesis of ideas, logical thought, particularly when directed at satisfying intellectual curiosity.	inquiring, curious, probing, exploring, intellectual, reflective, incisive, astute, logical, scrutinizing, theoretical, rational, inquisitive, analytical.

Note: Each scale description was copied from Jackson's PRF manual, pp.6-7, 1968.

APPENDIX C

Descriptive Statistics on the Rorschach Scores

Humanities Students

Variable	Mean(%)	Median	Mode	St.dev.	Skew	Kurt
HE	2.7	.02	0.0	.03	1.4	1.5
HM	25.5	.27	.27	.10	-.2	-.7
H	15.4	.15	.12	.76	.0	-.9
(H)	7.3	.06	0.0	.07	2.4	9.7
Hf	4.2	.04	0.0	.04	1.1	1.1
(Hf)	2.7	0.0	0.0	.04	1.3	.8
Hd	2.2	0.0	0.0	.03	.7	-.6
Hdx	0.0	0.0	0.0	.01	3.7	12.4

Appendix C (Continued)

Descriptive Statistics on the Rorschach Scores

Science Students

Variable	Mean(%)	Median	Mode	St.dev.	Skew	Kurt
HE	5.0	.03	0.0	.07	2.7	10.4
HM	25.8	.24	.35	.14	.1	-.9
H	15.3	.15	.04	.11	.7	.1
(H)	5.7	.55	0.0	.06	.6	-.5
Hf	4.0	.02	0.0	.06	2.9	11.7
(Hf)	2.6	0.0	0.0	.04	2.0	4.4
Hd	2.3	0.0	0.0	.04	2.4	5.8
Hdx	.1	0.0	0.0	.01	6.8	46.0

VITA

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