JOURNAL OF PERSONALITY ASSESSMENT, 1992, 59(1), 117-136

The Rorschach's Factor Structure: A Contemporary Investigation and Historical Review

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The Rorschach Inkblot Test was factor analyzed to assess for a two-dimensional structure that was expected to reflect the traditional interpretation of many scores, as well as two dimensions that have become a basic paradigm for studying self-reported personality and mood. In my sample (N = 268), Comprehensive System scores had a four-dimensional structure. These factors replicated many earlier findings but were independent of self-report measures. Two of the Rorschach dimensions were strongly defined by response frequency (R) and reflect the powerful impact that R has on determining scores and their intercorrelations. A third dimension was comprised of form-dominant shading determinants and partially corresponded to a hypothesized factor of dysphoria. The fourth dimension was comprised of holistic nonform-dominant color and shading determinants and appears to reflect Shapiro's (1965) description of the hysterical mode of cognition. This study suggests it is necessary to expand our conceptualization of the Rorschach to account for its reproducible factors.

In psychology there are two fairly distinct approaches to the assessment of personality and emotional functioning. One is more academically based, relies primarily on self-report inventories, and uses factor analytic methods of scale construction and validation. The other is more clinically based, relies more on projective measures, and tends to use contrasted group methods of validation. Historically, the academic and the clinical approaches have operated in relative isolation from each other.

This study has two goals, both of which seek to bridge these approaches to assessment. The primary goal is to evaluate the Rorschach with the factor analytic method in order to assess its internal structure. Factor analysis examines the correlations among a large number of variables to determine what

underlying dimensions could create the observed pattern of intercorrelations. Given the variety and complexity of scores obtained from the Rorschach, the factor analytic method can be particularly useful in elucidating the underlying dimensions that shape the raw data of the test. A secondary goal of this study is to determine the degree of correspondence between the Rorschach's factor structure and the two personality and mood factors that form a basic paradigm within the more academic approach to assessment.

ACADEMIC PERSONALITY AND MOOD RESEARCH

In the past 20 years, there has been a flurry of research into the basic structure of self-reported personality and emotional experience. The outcome has been broad agreement that extraversion (E) and neuroticism (N) are the major independent dimensions of personality, whereas positive affect (PA) and negative affect (NA) are the major independent dimensions of mood (e.g., Eysenck & Eysenck, 1985; McCrae & Costa, 1985; Watson & Tellegen, 1985). Even though there are important distinctions between mood and personality, it has also been shown that the same two-dimensional structure gives rise to phenomena in both realms (Meyer & Shack, 1989). At the level of underlying factor structure, the broad personality dimension of E and the broad mood dimension of PA share a common taproot. Similarly, the broad personality dimension of N shares its source with the broad mood dimension of NA.

There is little debate that these independent dimensions (E/PA and N/NA) form a bulwark in the academic approach to assessing personality and mood. The sheer volume and breadth of experimental, cross-cultural, longitudinal, genetic, and physiological studies that have been conducted on the E/PA and N/NA factors attest to this. However, to date, little effort has been made to integrate these factors into the clinical assessment of personality and emotional functioning.

THE RORSCHACH

Over the past 15 years, Exner (1986, 1991) has made significant advances in developing an empirically based and experimentally validated scoring system for the Rorschach. The Comprehensive System integrates and builds on all previous scoring systems and has served to placate some of the criticisms leveled against the Rorschach (Anastasi, 1988). Although Comprehensive System scores do not capture the full array of symbolic and sequential information that an experienced clinician utilizes to develop a finished interpretation, these indices allow one to use the test for normative comparisons and hypothesis testing research.

Significantly, a recent meta-analytic review of the Rorschach, Minnesota Multiphasic Personality Inventory (MMPI), and Wechsler Adult Intelligence Scale (WAIS; Parker, Hanson, & Hunsley, 1988) found that the Rorschach displayed indices of reliability and temporal stability that were equal to or greater than the MMPI and WAIS. Further, the Rorschach was found to have adequate validity coefficients, comparable to those of the MMPI or WAIS, when studies were conducted in either of two ways: (a) when experimental hypotheses were based on a strong theoretical rationale, or (b) when experimental hypotheses were based on previous research.

This study approached the factor analysis of Comprehensive System scores from both directions—first by developing hypotheses with a strong theoretical rationale and second by reviewing previous Rorschach factor analytic research.

Theoretical Rationale

In developing theoretical expectations, I assumed that the E/PA and N/NA paradigm reflects substantial dimensions of personality and mood. These dimensions were expected to be evident in the data of the Rorschach because this is a comprehensive measure of personality and emotional characteristics. I also assumed that some Rorschach scores would be more relevant for investigation than others. Specifically, Rorschach scores for determinants, organizational activity, and location were examined because they assess stylistic features of perception, personality, and affective life, similar to the E/PA and N/NA factors. Other types of Rorschach scores (e.g., special scores, form quality, populars, etc.) were excluded from this analysis because they had less clear links to the personality and mood factors.

Using Exner's (1986) interpretations, hypotheses about how the Rorschach would display an internally consistent structure corresponding to the E/PA and N/NA model fell rather neatly into place. The first factor was expected to be a general dimension of dysphoria. The second was expected to be a bipolar factor that had the *Erlebnistypus* at its core with associated traits of introversion and extraversion built around it. The hypotheses were as follows:

1. Scores of morbidity (*Mor*), inanimate movement (*m*), dimensionality from shading (*FV, VF, V*), diffuse shading (*FY, YF, Y*), and blends of shading (*Sh-Bl*), all indices of distressing and dysphoric affect, were expected to define the positive pole of an N/NA factor (Exner, 1986; Isen, 1984; Johnson & Magaro, 1987; Martin, 1985; Watson & Clark, 1984).
2. The egocentricity index (*Ego*) was predicted to define the negative pole of this factor, because high scores may represent a "narcissistic-like tendency to overestimate personal worth," whereas low scores indicate a negative self-image (Exner, 1986, p. 396; see also Watson & Clark, 1984).
3. Scores of human movement (M), form dimensionality (*FD*), unusual

detail (*Dd*), pure form proportion (*Lambda*), and organizational efficiency (*Zd*) were hypothesized to define the negative pole of the E/PA dimension. These indices denote the cautious, reflective, deliberate, and somewhat critical introspective qualities of the introverted/low PA person (Exner, 1986; Eysenck & Eysenck, 1985; Jung, 1971; Kagan, 1984; Zuckerman, Kuhlman, & Camac, 1988).

4. Whole responses (*W*), chromatic color (FC, CF, C) scores, and texture (*FT*, *TF*, *T*) scores (to a lower magnitude) were expected to load on the positive pole of the E/PA dimension. The style of global and inclusive perception, strong interpersonal needs, trial-and-error problem solving as well as orientation towards and responsiveness to the environment are all typical qualities of the extraverted/high PA individual (Exner, 1986; Eysenck & Eysenck, 1985; Isen, 1984; Isen, Daubman, & Nowicki, 1987; Jung, 1971; McCrae & Costa, 1989; Watson & Clark, 1990).

5. Color-shading blends (*C-Sh-Bl*) were predicted to load positively on both the first and second factors, indicative of the mixed emotional experiences of those who are high in both N/NA and E/PA (e.g., Hepburn & Eysenck, 1989). With less predictive certainty, it was anticipated that animal movement (*FM*) scores may load in a similar fashion, indicative of the impulse or need driven quality of these individuals.

6. White space (*S*) responses and achromatic color (*C'*) scores were believed to load highly on the first dimension (N/NA) and low on the second dimension (E/PA). These variables reflect the affective constraint and need for distance or independence that is characteristic of the introvert. In addition, they indicate the potential for these processes to result in the hostility, anger, tension, or distress typical of high N/NA individuals (Exner, 1986; Eysenck & Eysenck, 1985; Jung, 1971; Watson & Clark, 1984).

7. No specific predictions were made for the active to passive movement ratio, usual details, or the affective ratio (*Afr*).

This two-dimensional Rorschach structure was expected to be present simply on the basis of traditional variable interpretation in the context of two broad factors. A separate question was the degree to which these factors would correlate with self-report factors. The Rorschach and self-report inventories can be considered to sample distinct domains of personality, with the primary data pool of the Rorschach being tacit, less consciously mediated processes, and that of self-report inventories being cognitive schemata about the self (see Leary, 1957; McClelland, 1980). Given that the latter are dependent on a person's degree of self-awareness and willingness to state such awareness, these measures may or may not correspond to Rorschach data—similar to the way verbal reports of anxiety may or may not correspond to psychophysiological measures of anxiety.

Previous Rorschach Factor Analyses

To date, one factor analytic study using the Comprehensive System has been conducted with a sample of normal individuals (Mason, Cohen, & Exner, 1985). In partial support of the theoretically derived hypotheses, it was found that an E/PA factor (M, whole human content [*H*] vs. *FC*, *CF*) emerged as the third factor in the data—after response frequency effects were controlled by the first two factors. Unfortunately, the authors did not present a full matrix of factor loadings so a complete assessment of the hypothesized E/PA factor was not possible. In addition, only three factors were extracted from the correlation matrix so it could not be determined whether the fourth factor would have been the expected N/NA dimension. Thus, although the results were promising, they were inconclusive.

A search of the literature yielded 18 other appropriate factor analytic studies of the Rorschach (Borgatta & Eschenbach, 1955; Coan, 1956; Consalvi & Canter, 1957; Cox, 1951; Geertsma, 1962; Lotsof, 1953; Lotsof, Comrey, Bogartz, & Arnsfield, 1958; Mason et al., 1985; Schori & Thomas, 1972; Shaffer, Duszynski, & Thomas, 1981; Singer, Wilensky, & McCraven, 1956; Sultan, 1965; Williams & Lawrence, 1953, 1954; Wishner, 1959; Wittenborn, 1950a, 1950b). The factor solutions from these studies were then reviewed in a detailed systematic fashion. This review (see Meyer, 1989, 1992) indicated that there will generally be one, but occasionally two, *R* factors in all data sets. When *R* defines a single factor, this dimension is also consistently defined by *D*, *Dd*, pure form (*F*), number of contents, ordinary developmental quality (*DQo*), *S*, M, *FM*, *m*, *Zf*, *FC*, *FY*, *FC'*, and *FT*.[1]

After *R*, the next factor that emerged consistently across studies was one of global, synthetic, nonform-dominant determinants, in contrast to discrete pure form responses. This factor was defined by *W*, *CF* + *C*, *Zf*, IQ, *DQ+*, *TF* + *T*, and sum-*C'* on the positive pole and by F (or F%), *D*, and *Dd* on the negative pole. Although this was the general form of the factor, it exhibited a tendency to split into two separate factors in many studies. One component seemed more clearly indicative of cognitive investment or synthetic intelligence and was defined by *W*, *Zf*, IQ measures, integrative developmental quality (*DQ+*), and M. The other seemed more clearly indicative of general emotional investment or responsiveness and tended to be comprised of nonform dominant color and shading determinants (e.g., *C* + *CF*, *C-Sh-Bl*, vague developmental quality [*DQv*], *C'* + *C'F*, *Y* + *YF*, *T* + *TF*, *W*, and *V* + *VF*). Across all of the studies reviewed, no clear N/NA factor emerged. There was, however, a slight tendency for a bipolar E/PA factor to emerge from the data of nonpatients (e.g., M, human content vs. *C*, *CF*, *FC*).

[1]Tables from the review of previous Rorschach factor analyses are available from the author.

Thus, past research only partially supported the hypothesized E/PA factor and offered no justification for the N/NA factor that was expected on theoretical and interpretive grounds. Instead, the research indicated that one or two prominent response frequency factors will be present in all data sets. In addition, there should be a factor of global, synthetic, nonform-dominant determinants. I thought that the discrepancy between the conceptual hypotheses and previous research findings may, in part, have been due to the fact that virtually all previous research used scoring procedures other than the Comprehensive System. I felt this was particularly relevant to the absent N/NA factor, because the Comprehensive System has more variables that should define this dimension than any other scoring system. In addition to divergent scoring systems, previous studies employed a host of different factor extraction and rotation methods, varied tremendously in the number of factors they extracted, and frequently grouped variables together in an inconsistent fashion. Nonetheless, the data suggest that if the Rorschach does have E/PA and N/NA factors that correspond to variable interpretation and the academic paradigm, they will be evident only after a factor strongly defined by *R* and another factor of holistic, synthetic, nonform-dominant determinants have emerged.

METHOD

Subjects

The subjects were 268 volunteer college students (95 males, 173 females). The average age across subjects was 19, with a range from 17 to 32.

Measures

Self-report. The personality dimensions of E and N were obtained from scales developed for the MMPI (Costa, Zonderman, McCrae, & Williams, 1985; Gentry, Wakefield, & Friedman, 1985; Johnson, Butcher, Null, & Johnson, 1984). The Costa et al. study provided the most complete scale data and utilized a large group of mentally healthy medical patients in their factoring of the MMPI, so initial preference was given to their scales. Their 65-item Neuroticism scale was used because it originally displayed a coefficient alpha of .92 and demonstrated good convergent and discriminant validity in this sample. Their 23-item Extraversion scale had lower reliability (.80) and less precise convergent and discriminant validity in this sample. Therefore, a new 15-item E scale was constructed by utilizing items that occurred on at least two of the E scales from the three studies just listed (MMPI Form R items: 57, 99, 181, 207, 229, 292[−], 369[−], 371, 382, 383, 384, 389, 390, 392, and 397). Internal consistency was not

determined for this scale, though it displayed better convergent and discriminant validity than the original Costa et al. scale. State PA and NA mood scales were obtained from the Profile of Mood States (POMS), and trait scales were obtained from the trait form of the Multiple Affect Adjective Checklist (MAACL). Briefly, scales were formed by first reviewing studies that had factor analyzed these measures and identified PA and NA dimensions. Appropriate items were then analyzed in my sample, and PA and NA dimensions were replicated. Items with the best convergent and discriminant loadings were then retained to form 9-item scales. For the POMS, the PA and NA scales had reliabilities of .91 and .85, respectively. For the MAACL, the PA and NA scales had reliabilities of .83 and .81, respectively. The scales were as follows: POMS PA—full of pep, energetic, cheerful, active, vigorous, lively, good natured, alert, and carefree; POMS NA—on edge, angry, shaky, annoyed, anxious, nervous, confused, uncertain about things, and resentful; MAACL PA—energetic, cheerful, joyful, merry, enthusiastic, interested, active, good natured, and inspired; and MAACL NA—upset, worrying, annoyed, fearful, frightened, nervous, shaky, irritated, and mad.

Rorschach. All Rorschach protocols were collected by graduate students in a personality assessment course. The first two protocols for each graduate student were considered practice and discarded. Scoring for the remaining protocols was double checked by an advanced graduate student. To further assess reliability, I practiced blind scoring against 200 responses given in Exner (1985). Exact agreement was 88.4% for scores given and 96.5% for decisions regarding what to score and what not to score. Subsequently, 30 protocols were randomly chosen from the data pool, and the 16 scoring categories relevant to my study were blindly rescored. Exact agreement was found to be 87.5% for scores given and 96.1% when agreements were determined by score inclusion and exclusion. As a further check of consistency, all Rorschachs were evaluated by the year they were collected (to assess for any training inconsistencies) and by whether they were collected in the first half of a given year or the last half (to assess for effects related to examiner proficiency). No consistent differences were found in either of these analyses.

There is some debate whether it is best to analyze individual Rorschach scores on a single weighted continuum (e.g., *FY* = 1, *YF* = 2, *Y* = 3) or as discrete scores (e.g., *FY* treated independent of *YF* and of *Y*). Because the review of previous Rorschach factor analyses indicated that form-dominant scores have different qualities than nonform-dominant scores, I decided to treat these options as discrete variables within each determinant category. Similarly, because there were no notable differences between factors derived from parametric and nonparametric measures of association in prior factor analyses, the Pearson correlation was used here.

Procedures

A significant degree of colinearity was found among the Rorschach scores. This occurs when at least one variable is a linear combination of other variables, such that its score can be perfectly predicted from them. In the Rorschach, this occurs because *R* is a variable and it can be perfectly predicted by the sum of the location scores or by the sum of the primary determinants. Because of this colinearity, principal components was the only factor procedure that would effectively operate on the data. This procedure does not partition variance for a variable into two components—one that is common to the other variables in the matrix and one that is unique to the variable itself. As such, it is less affected by problems of colinearity than other factor analytic methods.

The number of factors to extract was determined by a combination of the dominant factor approach advocated by Watson and Tellegen (1985), Kaiser's criteria (eigenvalues greater than 1), and Cattell's scree test (utilizing the slope of the eigenvalues). Both uncorrelated (orthogonal) and correlated (oblique) factor solutions were examined.

RESULTS

Factoring of the Rorschach

A plot of the eigenvalues for the Rorschach data suggested that between two to nine factors should be extracted. Consequently, two to nine factors were extracted and rotated to orthogonal and oblique solutions. However, after the four-factor solution, oblique factors were not readily found and the factors were small and increasingly defined by only one or two determinants. Given that the focus of this study was on the broadest dimensions of the Rorschach, the two-, three-, and four-factor solutions were examined in detail. The orthogonal and oblique solutions were essentially identical (one oblique factor pair correlated .22 in the three-factor solution and .24 in the four-factor solution), so only the orthogonal factor solutions are presented here.

Not unexpectedly, both dimensions in the two-factor solution were strongly defined by *R*. By examining the left half of Table 1, one can see that Factor 1 included frequent responses and frequent use of all determinants, in contrast to pure form perceptions. *R* and all of the other determinants loaded positively on Factor 1, whereas *Lambda* had a strong negative loading. This appears to be a response articulation factor, or a factor that reflects the somewhat tautological position that frequent responding leads to increased scoring across all determinant categories.

The second *R* factor differed from the first in that it was primarily defined by location features rather than by determinants. For Factor 2, frequent pure form

TABLE 1
The Varimax Rotated Two-Factor Solution and the 45° Hand Rotated Solution for Rorschach Variables

Varimax Solution			*45° Rotation*		
Variable	*Factor 1*	*Factor 2*	*Variable*	*Factor 1a*	*Factor 2a*
C-Sh-Bl	66[a]	−19	*R*	91[a]	−13
FY	61[a]	22	*D*	73[a]	−46[a]
FC'	57[a]	−11	*Dd*	70[a]	−21
FC	55[a]	05	*FY*	57[a]	30[a]
CF + C	55[a]	−16	*S*	54[a]	18
Sh-Bl	54[a]	−04	*M*	50[a]	11
m	54[a]	00	*FM*	48[a]	21
S	52[a]	26	*FC*	42[a]	36[a]
FM	49[a]	20	*m*	38[a]	38[a]
FV	47[a]	01	*Afr*	35[a]	27
W	46[a]	−28	*FV*	34[a]	33[a]
Mor	44[a]	−19	*YF + Y*	27	16
M	42[a]	29	*FT*	18	17
FD	34[a]	−09	*VF + V*	13	11
YF + Y	30[a]	09			
TF + T	28	01	*Lambda*	06	−76[a]
FT	24	02	*C-Sh-Bl*	33[a]	60[a]
C'F + C'	24	−16	*W*	12	53[a]
VF + V	18	01	*Zd*	−17	52[a]
			CF + C	26	51[a]
D	21	83[a]	*FC'*	32[a]	49[a]
R	54[a]	76[a]	*Morbid*	17	44[a]
Dd	34[a]	66[a]	*Sh-Bl*	34[a]	42[a]
Lambda	−49[a]	58[a]	*FD*	17	30[a]
Zd	25	−48[a]	*Ego*	−10	30[a]
Afr	05	45[a]	*C'F + C'*	05	29
Ego	14	−27	*a/(a + p)*	−17	22
a/(a + p)	03	−26	*TF + T*	19	20

Note. Decimals have been omitted.
[a]Indicates a loading above |.30|.

responses to discrete blot areas stood in contrast to more integrative perceptual gestalts. This factor was defined by *R*, *D*, *Dd*, *Lambda*, and *Afr* on the positive pole and by *Zd*, and to a lesser extent, *W*, *Ego*, and greater active movement on the negative pole. Factor 2 may represent a bipolar cognitive–motivational factor that contrasts frequent but shallow task engagement (e.g., *R*, *D*, *Dd*, *Lambda*) with infrequent but deep engagement (e.g., *Zd*, *W*, *Ego*). The positive loading from the *Afr* suggests that for those individuals prone to give a high frequency of economical, unelaborated, or constricted responses, Card X may be an ideal stimulus to elicit this tendency given the broken up nature of its discrete blot areas (in contrast to Cards VIII and IX which also comprise the

Afr). The mild negative loading on Factor 2 from the *Ego* Index seems to reflect the synthetic cognitive operations that contribute to the identification of pair or reflection responses.

In an effort to localize the effects of *R* onto a single factor and thereby make my study comparable to the factor analytic research reviewed previously, the two factors were manually rotated 45° within the two-dimensional space. This can be visualized by recognizing that the two factors form intersecting perpendicular lines, with one factor that transverses from north to south and the other from east to west. In the varimax solution, *R* loaded positively and strongly on both factors, indicating it was located in the space between the factors (i.e., in the north–east quadrant). Therefore, the axes of the two factors were rotated 45° from their original positions so that one factor now ran from north–east to south–west, and the other factor now ran from north–west to south–east.

Upon rotation, the results of previous factor analytic research were essentially replicated. By comparing the factors on the right half of Table 1 with the review discussed previously, one can see that the single *R* factor is evident as Factor 1a in the current data set. Factor 1a is strongly defined by *R*, the detail location areas, *S*, form-dominant color and shading determinants, and movement scores. Factor 2a also replicates previous findings and is the bipolar factor of holistic, integrative, nonform-dominant determinants, in contrast to discrete pure form responses. This factor is defined primarily by *W*, *Zd*, CF + C, and C-*Sh-Bl* on the positive pole, and by *Lambda* and *D* on the negative pole.

When the three-factor solution was examined a clear unipolar dimension of nonform-dominant holistic perceptions was apparent. Factor 3 was comprised of CF + C, YF + Y, *m*, C′F + C′, *W*, TF + T, and C-*Sh-Bl*. It corresponded to the factor found in previous research that was tentatively termed the general emotional investment factor.

In the four-factor solution, a factor of form-dominant shading became apparent. Factor 4 was defined by *FV*, *Sh-Bl*, *FY*, C-*Sh-Bl*, *VF* + *V*, *FT*, *FC′*, and *Ego* on the positive pole and by *Lambda* on the negative pole. It did not correspond to a dimension found in previous research, but did display many features of the hypothesized N/NA factor. Missing, however, were positive loadings from most of the nonform-dominant shading variables, morbid responses, and *m*. In addition, the egocentricity index loaded on this factor in a direction opposite of prediction.

Factoring of the Mood, Personality, and Rorschach Data

In order to more directly assess the correspondence between Rorschach factors and the academic paradigm of personality and mood, Rorschach variables were factored with the E, N, PA, and NA scales. A plot of the eigenvalues indicated unambiguously that six factors should be extracted. Given this, six factors were extracted and rotated to an orthogonal solution. From Table 2, one can see that

TABLE 2

The Varimax Rotated Six-Factor Solution From a Principal Components Analysis of the Rorschach, Mood, and Personality Data

		Six-Factor Solution					
Variable	*h2*	*F1*	*F2*	*F3*	*F4*	*F5*	*F6*
S	56	62[a]	25	04	−03	26	19
W	65	57[a]	−27	−24	41[a]	19	−01
M	49	55[a]	32[a]	10	−04	−19	−20
FC	38	53[a]	07	14	17	14	13
FM	38	53[a]	23	18	02	−10	−07
FC'	46	49[a]	−10	34[a]	04	23	20
Morbid	29	49[a]	−16	09	13	−04	02
FD	19	38[a]	−07	10	03	−13	11
D	79	02	87[a]	17	11	00	−04
R	93	46[a]	79[a]	06	25	14	04
Dd	63	36[a]	66[a]	13	−12	10	16
Lambda	69	−39[a]	52[a]	−39[a]	−16	25	14
Afr	30	−03	48[a]	01	07	−23	08
Zd	38	36[a]	−47[a]	08	−06	−09	07
a/(a + p) mov.	08	01	−26	−01	08	03	09
Sh-Blend	50	14	01	64[a]	17	02	19
FV	46	10	07	64[a]	09	−11	12
FY	54	33[a]	26	58[a]	13	−03	−09
C-Sh-Blend	56	28	−13	55[a]	40[a]	04	09
FT	17	07	03	38[a]	01	09	−12
VF + V	27	−14	03	38[a]	09	13	28
CF + C	56	23	−10	13	68[a]	07	09
YF + Y	49	−08	16	14	66[a]	04	−06
m	41	35[a]	06	08	53[a]	04	−00
TF + T	32	05	07	06	52[a]	−15	−10
C'F + C'	28	−03	−12	09	45[a]	04	22
MAACL–PA	58	03	−05	05	02	76[a]	01
POMS–PA	62	02	−12	07	−02	73[a]	−26
MMPI–E	50	10	10	43[a]	−03	50[a]	−22
Egocentricity	46	22	−23	30[a]	−22	−44[a]	−15
MMPI–N	60	13	05	02	−17	−08	74[a]
MAACL–NA	50	05	−01	05	10	−03	70[a]
POMS–NA	57	17	−07	05	12	−37[a]	62[a]

Note. h2 = final communality. Decimals have been omitted.

[a]Indicates a loading above |.30|.

Factors 1, 2, 3, and 4 are the previously discussed Rorschach factors, whereas Factor 5 is the E/PA dimension and Factor 6 is the N/NA dimension.

The four Rorschach factors in this solution corresponded quite closely to the four-factor solution observed when the Rorschach was factored alone. All convergent correlations between these two sets of Rorschach factors were in excess of .96. This demonstrated three things: (a) that the earlier Rorschach solutions were stable, (b) that Rorschach variables were minimally impacted by the inclusion of other mood and personality data, and (c) that the Rorschach contains virtually no overlap with the predominant model of self-rated mood and personality because the latter scales defined their own distinct factors within the combined factor analytic space.

Only one Rorschach variable had a significant association with the mood and personality factors. This was the negative loading on Factor 5 (the E/PA dimension) from the *Ego*. In conjunction with the negative loading from the POMS state NA scale on this factor, the data suggest that a high *Ego* may measure introversive experiences of transient negative affect. The mood and personality scales also had only one significant association with the Rorschach factors. The E scale displayed a significant positive loading on Factor 4, the Rorschach's form-dominant shading factor. This is counter to expectation, because this Rorschach factor would be interpreted as a dimension of distressed negative affect.

DISCUSSION

In this study, Rorschach variables were observed to have an underlying structure of four basic dimensions. These four factors were distinct from the self-rated E/PA and N/NA factors of personality and mood.

Two of the four Rorschach factors were strongly defined by *R*. Factor 1 was defined by *R* and all of the determinants (e.g., *C-Sh-Bl*, *FY*, *FC'*, *FC*, *m*, *M*, *S*, etc.) on the positive pole and by *Lambda* on the negative pole. This factor is difficult to conceptualize as a single psychological continuum because it is defined by such diverse variables. It may be considered an articulation factor that reflects a tendency to see and describe many qualities of the inkblots. However, more simply, Factor 1 may just reflect the fact that the number of times one responds to the Rorschach determines to a large degree the number of determinants that will be found across all determinant categories. As *R* increases so does the general frequency of all determinants, and as *R* decreases so does the general frequency of all determinants. If this is the case, Factor 1 can be considered a statistical artifact of Rorschach administration procedures. Because *R* is a variable rather than a constant, in general, the number of determinants scored in a protocol is a direct function of the number of responses that are available to score.

Note that Factor 1 is the largest factor in the Rorschach data. As such, it indicates that this association between fluctuations in *R* and fluctuations in raw scores from all determinant categories is the single greatest source of explainable variance within the Rorschach data.

The second *R* factor was the next largest score of explainable variance. Factor 2 indicated that locations within a card (*D* and *Dd* areas) and within the test as a whole (*Afr* and probably primarily Card X) where many form-only (*Lambda*) responses are observed. The proclivity to generate many discrete form-only responses was in contrast to the tendency to give fewer but more synthetic or integrative responses (*Zd* and, to a lesser degree, *W*, *Ego*, and active movement). This is likely to be a more psychological factor than the first, perhaps reflecting a productive but superficial style of engagement with tasks. The loading from the *Afr* on Factor 2 suggests that individuals prone to give a high frequency of economical or constricted responses may find Card X an ideal stimulus to elicit this tendency, given the broken up nature of its discrete blot areas.

Significantly, when Factors 1 and 2 were rotated 45° within the two-dimensional space, the observed structure replicated the main dimensions that had been found in previous factor analytic research with the Rorschach. The effects of *R* were no longer split between two factors. Instead, Factor 1a was now almost purely defined by *R*. Factor 1a was also strongly associated with the detail location areas and the most frequently scored determinants (movement and form-dominant color and shading). Like Factor 1, Factor 1a may be more of an artifact than a psychological dimension. Factor 1a indicates that as *R* increases so do the number of commonly scored determinants and detail location areas. Fewer responses coincide with fewer common determinants and fewer detail locations. Therefore, Factor 1a appears to index the location and determinant features of a protocol that change most noticably and most directly as a function of *R*.

Also evident after rotation was Factor 2a. This factor was defined by *W*, *Zd*, *CF + C*, *C-Sh-Bl*, *Sh-Bl*, *FC'*, *Mor*, *m*, *FC*, *FV*, *FY*, *FD*, and *Ego* on the positive pole and by *Lambda* and *D* on the negative pole. Factor 2a appears to reflect cognitive and emotional investment in the task as opposed to more simplistic or efficient responding. It differs from Factor 2 primarily by the fact that it is not impacted by *R* or the *Afr*. As such, it seems to be a measure of one's depth of cognitive and affective engagement that is unaffected by productivity.

The fact that two alternative rotations can be found within the same factor analytic space is not unusual. It simply indicates that the placement of the axes is indeterminate and that the worth of one rotation over another needs to be determined by other empirical information. Most previous research had *R* defining a single factor. Because this yields a degree of conceptual clarity and simplicity when interpreting Rorschach factors, the second rotation is probably the preferred solution. However, the original rotation indicates that *R* can have a dual role in the Rorschach. On one hand, *R* is correlated with the degree to

which scores accrue across all determinant categories (Factor 1), and this probably serves to dilute the interpretive significance of raw scores. On the other hand, when interpreted in conjunction with *Lambda* and the discrete blot areas (Factor 2), *R* may also gauge an individual's propensity to skim through the task without significant engagement. Whether Factor 2 indicates a situational flight from the task or a more long-standing characteristic is uncertain.

Irrespective of which rotation is deemed most useful, an essential finding is that in this and all other investigations the impact of variable response frequency is pervasive and robust. Averaged across factor analytic studies, the *R* factor(s) accounts for approximately 50% of the explainable variance among Rorschach scores. This highlights the preeminent role *R* plays in determining the structural data of the test. Unfortunately, this role is inconsistent with the minimal significance that is generally afforded to *R* when interpreting a protocol. Additional research is clearly needed to more fully recognize and understand the powerful role(s) that *R* plays in determining Rorschach data (see Meyer, 1992, for a more detailed discussion).

This investigation also revealed a factor of form-dominant shading determinants. Factor 4 was defined by *FV, Sh-Bl, FY, C-Sh-Bl, VF + V, FT, FC',* and *Ego* on the positive pole and by *Lambda* on the negative pole. This factor was not found in previous research, although it resembled the N/NA dimension hypothesized to be present. However, in contrast to hypotheses, a number of significant Rorschach variables did not load on Factor 4 in the expected fashion (e.g., most nonform-dominant shading variables, *Morbid, m*), whereas the E scale was positively related to this factor and the N/NA scales showed no significant relationship. The egocentricity index also loaded positively on Factor 4. This was counter to prediction but is more consistent with the current interpretation of this variable (Exner, 1991). Taken together, the evidence provides tentative support for considering Factor 4 to be a Rorschach N/NA dimension. It would be valuable for future research to explore what qualities differentiate the variables that load on Factor 4 from the other Rorschach variables that should be measures of negative affect. In addition, it would be fruitful to determine the features that account for the independence between Rorschach and self-report measures of negative affect.

The Holistic, Nonform-Dominant Color and Shading Factor

Perhaps the most salient Rorschach finding from this investigation concerns Factor 3, the Holistic Nonform-Dominant Color and Shading factor. Factor 3 was defined by *CF + C, YF + Y, m, C'F + C', W, TF + T,* and *C-Sh-Bl* and was found consistently in previous research after *R* factors were extracted. Because color and shading features of perception take dominance over form features, it is likely that this factor would also have been associated with vague perceptions,

had Exner's scores for developmental quality been included in the matrix. Significantly, in one of the few factor analytic studies to include this variable, it was found that *DQv* defined a factor similar to Factor 3 in a sample of depressed patients (Mason et al., 1985). Because whole responses help define Factor 3, it probably reflects holistic "impressions," rather than acutely focused and differentiated perceptions. This interpretation is bolstered by the negative loading on this factor from the *Ego*, as this index is predominantly comprised of discrete, well-differentiated, and sharply focused pair responses.

In 1977, Shapiro discussed the perceptual foundation for color responding as "a more immediate and passive experience than form perception" (p. 269). It is a more sensorially direct perceptual style that has the quality of "capturing" attention, much like a child's attention is captured by what is bright, shiny, or novel. In his classic work, *Neurotic Styles*, Shapiro (1965) linked this cognitive style with the mode of perception used by the hysterical personality. Shapiro stated: "hysterical cognition in general is global, relatively diffuse, and lacking in sharpness, particularly in sharp detail. In a word, it is *impressionistic* . . . (and) highly susceptible to what is immediately impressive, striking, or merely obvious" (pp. 111–112).

Elsewhere, for both theoretical and empirical reasons, it has been argued that the distinctions between chromatic color, achromatic color, shading, and texture are overblown and perhaps unnecessary (see Singer & Brown, 1977; Wittenborn, 1950a, 1950b). My analysis lends some credence to this position, but only for nonform-dominant responses, because these responses converge on a single factor. Although there may be important affective differences between the various color and shading scores, Factor 3 appears to index a cognitive–perceptual style. At this level of analysis, it is the degree of form dominance that is the most salient feature, and this cognitive quality takes precedence over affective content.

Review of the factor loading matrix in Table 2 reveals that *M* and *FM* display the same pattern of convergent and discriminant loadings across factors. This pattern is very different from the pattern observed with *m*, which loads on the Holistic Nonform-Dominant Color and Shading factor. Therefore, *m* may be perceptually more similar to the diffuse hysterical style of cognition than the other forms of movement. Because many *m* responses tend to be nonform dominant (e.g., explosions, blood dripping, water running, and clouds moving), it would probably be useful to begin measuring movement in the same manner that other determinants are measured—namely, by their degree of form dominance, rather than simply by their content. Adopting such an approach is likely to enhance the clarity and definition of this factor. For similar reasons, it would also be worthwhile to determine if the rare formless *M* response (e.g., love, anger, etc.) defines this dimension.

The factor analytic method has consistently indicated that the Holistic Nonform-Dominant factor is a reliable Rorschach dimension. Unfortunately, to

date it has not received the clinical and research attention it deserves. Although this factor does not correspond to the self-report paradigm of personality and mood or to current interpretive practices, theoretical evidence suggests that it corresponds to a significant cognitive–perceptual style. Future research should attempt to maximize the fidelity of this compelling factor and pursue its link to the hysterical style of cognition.

General Conclusions

Several general conclusions can be drawn from this study. First, the Rorschach's factor structure is distinct from the E/PA and N/NA dimensions that have become the most widely accepted paradigm for studying self-rated personality and mood. Some may consider this finding an indictment of the Rorschach's validity. However, the data just as readily suggest that it is self-report measures that tap only certain limited aspects of personality and emotional functioning. For some time, theorizing has postulated important distinctions between the data obtained from self-assessments and projective assessments, and recent research has begun to demonstrate that these data sources provide complementary but very distinct types of information (e.g., McClelland, Koestner, & Weinberger, 1989). My study supports this distinction and suggests that self-report data should not be used as validation criteria for the Rorschach. Simultaneously, however, this study highlights the need to conduct additional research into the areas where self- and Rorschach assessments are distinct and where they interface. This would include defining the scope and limitations of each data source, as well as clarifying the factors that lead to greater correspondence and greater dissynchrony across these levels of analysis.

The second general conclusion is that the Rorschach exhibits a relatively consistent factor structure. Factors 1a, 2a, and 3 found in this study with the Comprehensive System have been regularly observed in previous research, despite the use of different variables, scoring systems, subject populations, and factor analytic methods. The replication of these dimensions across 40 years of research demonstrates their reliability and underscores their importance as the infrastructure of the test.

A third conclusion is that the Rorschach's internal structure does not clearly correspond to that which would be expected from traditional variable interpretation. One could argue that the hypothesized Rorschach structure was simplistic, overly generalized, and, therefore, prone to failure. Although it is true that the hypothesized structure was very general and based on broad notions of how different variables should relate to each other, it is just these broad interrelationships that need to be hypothesized when using a factor analytic methodology. Further, although additional small factors might have been postulated, given current interpretative practices it seems doubtful that a significantly different set of basic dimensions could have been hypothesized to underlie these

specific Rorschach variables. This is particularly the case for a dimension of dysphoria or negative affect. Finally, and more to the point, with the exception of Shapiro's (1965, 1977) partial account, it is very doubtful that any theoretical perspective would actually predict the Rorschach structure that has emerged in this study and repeatedly in previous research.

Some may consider these consistent but unexpected findings to be evidence that the factor analytic method is inappropriate for the data of the Rorschach (as one reviewer suggested). It seems the reasoning is that because the results from this method do not conform to what would be expected, the method must be in error. Although there are problems in applying the factor analytic method to Rorschach data (e.g., colinearity and use of variables with skewed distributions), factor analysis simply analyzes the broad interrelationships that occur among the scores from the test as they are utilized in clinical practice. Therefore, it seems more reasonable to conclude that factor analysis provides reproducible data that can inform our judgment and expand our conceptualization of what is being measured by this complex and multifaceted instrument.

With that said, it should also be recognized that the factor analytic findings do not directly contradict traditional score interpretations. In part, this is because tentative support was found for the hypothesized N/NA factor. In addition, there is still considerable variability for each score that remains unaccounted for by the factors. With the exception of *R* and the location scores, most other variables have final communalities that are less than .50. This indicates that the factors in combination account for less than 50% of the variance in these scores. As such, there is still ample room for there to be unique interpretive variance associated with each score.

What the factor analytic findings do indicate is that the traditional interpretations are not the central features that organize Rorschach data at the broadest level of analysis. Instead, the principal factors that order the data are: (1) *R* and increased articulation of all determinants; (2) *R* and superficial form-only engagement with detail blot areas; (3) the hysterical style of holistic, nonform-dominant color and shading perception; and (4) identification of form-dominant shading features. When the alternative rotation is used to localize the effects of *R* on a single dimension and make my investigation consistent with historical research, the first two factors become: (1a) pure *R* with increased use of detail locations and common determinants, and (2a) cognitive–emotional task involvement unaffected by *R*.

Additional Rorschach factors may become evident when other scores are included in a data matrix. However, at the present time it would be profitable to expand our knowledge of these dimensions through theoretical and empirical efforts that seek to determine how they facilitate the clinical utility of the Rorschach. To this end, Table 3 provides a method for computing composite estimate scores (Rummel, 1970) to quantify an individual's position on each factor.

TABLE 3
Composite Estimate Factor Scores to Assess the Rorschach's Primary Dimensions

1. *R* and Determinant Articulation
   .3(*R*) + .4(FY) + .3(*FC'*) + .3(*m*) + .3(*S*) + .3(FC) + .25(M) + .25(*FM*) + .2(*FV*) − .25(*Lambda*)
2. *R* and Superficial Engagement With Detail Locations
   .6(*R*) + .7(*D*) + .45(*Dd*) + .35(*Lambda*) + .2 (*Afr.*) − .25(*Zd*)
1a. Pure *R* With Detail Locations and Common Determinants
   .8(*R*) + .5(*D*) + .5(*Dd*) + .3(FY) + .3(*S*) + .25(M) + .25(*FM*) + .15(FC) + .15(*m*)
2a. Cognitive–Emotional Engagement Unaffected by *R*
   .35(C-*Sh*-*Bl*) + .3(*W*) + .25(*Zd*) + .25(CF + C) + .25(*FC'*) − .6(*Lambda*) − .2(*D*)
3. Hysterical Style of Holistic Nonform-Dominant Color and Shading
   .45(CF + C) + .4(*YF* + *Y*) + .3(*m*) + .25(*C'F* + *C'*) + .2(*W*) + .17(*TF* + *T*) + .17(C-*Sh*-*Bl*)
4. Form-Dominant Shading (Negative Affectivity?)
   .45(*FV*) + .4(*Sh*-*Bl*) + .3(FY) + .25(C-*Sh*-*Bl*) + .1(*FT*) + .1(*FC'*) − .2(*Lambda*)

Note. Variables were selected for maximum definition of the factor while maintaining discrimination from other factors. Each variable is weighted by the approximate square of its factor loading because this is the amount of variance it shares with the factor. To compute factor scale scores, each variable must contribute equally so an individual's standard score for each variable must be utilized.

ACKNOWLEDGMENTS

A version of this article was presented at the annual meeting of the Society for Personality Assessment, March 9, 1991, New Orleans, where it received the Samuel J. and Anne G. Beck Award for Early Career Research.

I thank John R. Shack, James E. Johnson, Dan P. McAdams, James R. Sands, and Robert Lipgar for their helpful comments and suggestions and Marvin Acklin for making available the raw data analyzed in this study.

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Received September 27, 1991