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Arie Cohen

Abstract: *The purpose of the present study is to compare the solution of a previously published Rorschach factor analytic study to an SSA solution of the same data. This analysis yielded a radex structure with a modulating facet ranging from number of responses and location scores at the origin to determinants and response quality at the periphery. The polarizing facet divided the map into sectors representing response determinants – color variations vs. form variations. This solution supports Rorschach's original scoring system but suggests that the distinctions between different types of movements (human vs. animal), colors (chromatic, achromatic, and shading) and the distinction between them and their primary form counterparts have been exaggerated.*

The scientific status of the Rorschach test is one of the most controversial issues among clinical psychologists and psychometricians alike. It is the most revered and most reviled psychometric instrument. Thus, while Exner (1993) points to the Rorschach inter-rater reliability and Hiller, Rosenthal, Bornstein, Berry & Brunell-Neuleib (1999) have demonstrated its respectable validity, Lilienfeld, Wood & Garb (2000) consider it a problematic instrument from a psychometric standpoint.

One common approach to obtain insight into the underlying structure of a psychometric instrument and to support its theoretical assumptions is through factor analysis. Indeed, several studies have been executed in order to bridge the gap between theory and research concerning the modern scoring system of the Rorschach (Anderson & Dixon 1993; Costello 1998; Meyer 1989, 1992). Nevertheless, the findings of these studies were quite disappointing. Meyer, who had reviewed several factor-analytic studies of the Rorschach and conducted some of these studies himself, concluded that although the Rorschach

exhibited a relatively consistent factor structure, its "internal structure does not clearly correspond to that which would be expected from traditional variable interpretation" (Meyer 1992: 132).

In view of the lack of support of factor-analytic studies for a clear theoretical underlying structure of the Rorschach, the use of non-metric alternatives to factor analysis should be considered. Furthermore, these alternatives may be less sensitive than factor analysis to issues that characterize the Rorschach scores such as collinearity, interdependence, variables with skewed distribution, very low or very high base rates, and very small variances.

One of these nonmetric alternatives to factor analysis relates to the multidimensional scaling (MDS) approach (Guttman 1966, 1968; Kruskal 1964). The above methodologies represent variables as points in an Euclidian space with interpoint distances corresponding to proximity measures among the variables (e.g. intercorrelations). The underlying assumption of this approach is that the isomorphism between the proximity measures and their interpoint distances in a Euclidian space enables direct observation in an intercorrelation matrix which may highlight data structures that are not so apparent in factor-analytic solutions.

In view of the potential of this approach in revealing aspects of the data that may be obscured by traditional factor-analytic techniques, the purpose of the present study is to reanalyze the intercorrelation matrix of a previously published Rorschach score. The data that were selected for this analysis are those of Zillmer & Vuz (1995). These data were selected because of the authors' careful selection of the variables that are appropriate for factor analysis and their meticulous approach in handling all the technical aspects of performing factor analysis, as well as their detailed report of their finding. Zillmer's & Vuz' (1995) data were based on Rorschach protocols of 160 psychiatric inpatients. They have identified among 17 comprehensive system scores four factors: (a) Holistic Response (Zf, W, M), (b) Perceptual Accuracy (X+%, X-%, P, F+%), (c) Non-Form-Dominant (CF+C, C'F+C', ShadeF, M), and (d) Form dominant (FC, Fshd, S, R, FC', FD). Zillmer & Vuz admit that their four-factor solution does not offer a complete model of the Rorschach scoring system but conclude nevertheless that it indicates that the current scoring system provides distinct domains of personality. Thus, it is of interest to examine whether the MDS approach leads to the same conclusion.

Results and Discussion

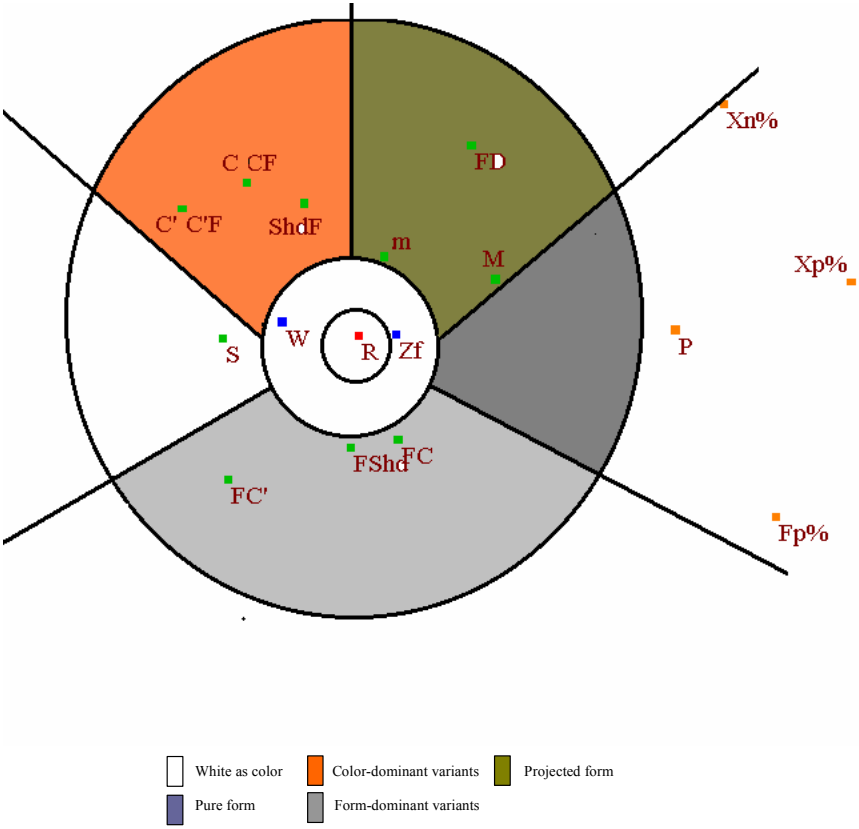
Zillmer's and Vuz' (1995) original intercorrelation matrix was reanalyzed by Smallest Space Analysis (SSA; Amar & Toledano 2001) and yielded a two-dimensional solution (see Figure 1) with a coefficient of alienation of .176. This coefficient is the loss function of SSA and it measures the goodness of fit between the obtained solution and the original data. It ranges from 1 to 0 (the later represents a perfect match). A value of .2 or less indicates a good fit (for further discussion of mathematical aspects of SSA, see Borg & Shye 1995).

At the center of Figure 1 appears the total number of response (represented by the letter R) a variable that correlates with all Rorschach measures. The second circle in Figure 1 contains two holistic measures that indicate an integrative ability, an ability to perceive the card as a whole (W) or to integrate different parts of the cards into a holistic percept (Zf). Five sectors, which contain response determinants, divide the next circle. The left sector in the third circle contains space response (S), namely, a white-color response.

The next sector moving clockwise contains color (C) and color-variations responses, such as shading and achromatic-color determinants (C, CF, ShdF, C', C'F). The next sector contains three figure dominant 'projective' scores, i.e., responses that incorporate form and additional characteristic such as movement (M – human movement, m – inanimate movement) or dimensionality, like depth or distance (FD). The next sector is empty but from the overall structure of Figure 1, we may infer that it should have included pure-form responses (F). The last sector represents variations of form responses such as form with color (FC), achromatic color (FC') or shading (FShd). The next circle has only one sector (adjacent to the empty sector which is assumed to represent pure form responses), which represents perceptual accuracy including responses of pure good form (F+%); popular (P) or conventional responses (X+%); or lack of perceptual distortion (X-%).

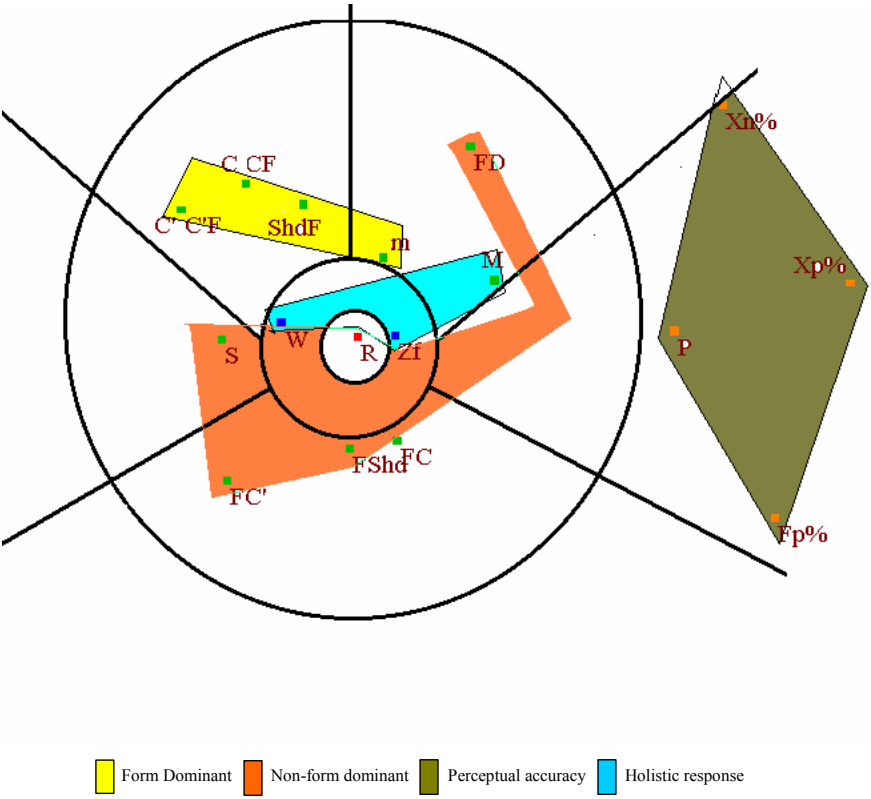
The present SSA solution represents a radex structure (Guttman 1954). The modulating facet ranges from general productivity measure (number of responses) at the origin of the figure, 'holistic and organizational' measures next, then scores of response determinants and finally 'accuracy' measures at the periphery. The polarizing facet relates mainly to the response-determinant section and includes its main characteristics. One sector represents variations of form responses while the opposite sector represents variants of color responses. Between these two polarities appears a sector with variants of form response with additional characteristics (movement or depth – 'projective forms') and a sector with form responses that includes a white space.

Figure 1 Smallest space analysis of Rorschach data from Zillmer & Vuz (1995)



The present SSA solution is not much different from Zillmer's & Vuz' (1995) original solution. Figure 2 contains Zillmer's & Vuz' factor solution superimposed on the SSA solution. The Perceptual Accuracy factor of Zillmer & Vuz matches the same region in the present solution. Their Non-Form-Dominant and Holistic Response factors are very similar to the 'color variations' region and the Holistic Measures region in the SSA solution, respectively.

Figure 2 Factor analysis solution of Rorschach data from Zillmer & Vuz (1995) superimposed on the SSA solution



Nevertheless, in spite of the similarity between the factor-analytic solution and the SSA solution, the SSA solution is more elegant, it is without any deviations, and it presents a holistic view of the interrelations among the regions ('factors'). Furthermore, the present interpretation of the underlying structure of the Rorschach is based solely on the perceptual characteristics of the response rather than on any personality characteristics.

In general, the present study suggests that the Rorschach responses can be categorized into four main determinant categories: form-only, form-dominant, color-dominant, and white-space responses. Furthermore, from the present study its seems that the distinctions among the variations of color responses (chromatic, achromatic, and shading), among primary-form responses (combinations of form responses with colors, chromatic colors, and shading), and among movement responses (human vs. animal) are somewhat artificial (cf. Meyer 1989).

Finally, the findings of the present study support the basic concepts in Rorschach scoring systems – productivity, location, determinants, and form quality – but not necessary its clinical implications. Nevertheless, these findings are based on one sample of hospitalized patients and the Rorschach scores are not controlled for the number of responses, a factor that may skew the findings.

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