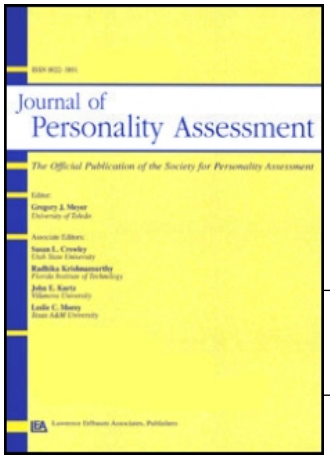

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Rorschach Developmental Quality and Intelligence Factors

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Research has demonstrated a relationship between cognitive development and the location and complexity of Rorschach responses. This study examined the association between the Wechler Adult Intelligence Scale-Revised (WAIS-R) and Exner's Developmental Quality (DQ). This study had two objectives: to examine the relationship between DQ and WAIS-R intelligence factors and IQs and to determine whether the DQv/+ score taps a synthesizing visual-perceptual operation. An overall goal was determining the extent to which DQ represents Friedman's operationalization of Werner's orthogenetic principle. Subjects were 125 nonclinical volunteers. Findings suggest that DQ taps a visual-perceptual problem-solving skill in which complex whole responses make the most significant contribution. There was no evidence that DQv/+ responses represent visual-perceptual synthesis. It was concluded that DQ is not an operationalization of Werner's orthogenetic principle and that developmental quality, at least in the sense that Werner or Friedman might have intended it, may be a misnomer.

A long, substantive tradition of research has examined the relationship between cognitive development and the location and complexity of Rorschach responses. In a late conceptualization, Werner (1957) postulated that development "precedes from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration" (p. 26). Earlier, Friedman (1953) operationalized Werner's "orthogenetic principle" and derived a Rorschach measure of developmental level (DL) using the structural and organizational features of Rorschach percepts. Applied to the Rorschach, the more differentiated, complex, and integrated the percept, the "higher" the DL score. Various schemas for weighting DL scores as developmentally low or high have been developed and utilized (Becker, 1956; Wilensky, 1959). Several studies have confirmed the positive relationship between DL scores and measures of intellectual ability (Goldfried, Stricker, & Weiner, 1971). The strongest

findings, however, have linked complex whole responses with measure of cognitive ability (Allison & Blatt, 1964; Marsden, 1970; Smith, 1981).

Using the WAIS and Friedman's DL measure with 86 psychiatric inpatients, Greenberg and Cardwell (1978) found that DL and WAIS intelligence factors (Verbal Comprehension, Perceptual Organization, Freedom From Distractibility; Kaufman, 1975) shared enough common variance to suggest their saturation with a nonspecific general intelligence factor, similar to Spearman's "g." Their findings confirmed the relationship between perceptual differentiation and level of intellectual ability.

In retooling Rorschach scoring criteria for the Comprehensive System, Exner (1974, 1986) encountered several significant problems with Friedman's DL scoring system. As a consequence, Exner constructed a less complex developmental scoring system called Developmental Quality (DQ). In his efforts to purify DQ, Exner changed several features of DL. He: (a) utilized fewer scoring categories, (b) dispensed with Friedman's scoring criteria for "broken" versus "unbroken" blots, and (c) eliminated scoring criteria related to form accuracy (minus responses) and special scores (confabulatory, fabulized combination, and contamination responses). During the course of refining DQ, Exner (1983) added another code to signify "synthesis activity occurring in responses that previously would have been coded as vague" (p. 96). The addition of these DQ scores was based on the finding that a significantly higher frequency of these responses ocurred in those subjects scoring in the upper quartile of problem-solving tasks and conceptual tasks on the Halstead Reitan neuropsychological battery (Exner, 1983). The new code was designated "v/+."

Exner (1986) claimed that "DQ appears to be related to the willingness and capacity to analyze and synthesize the stimulus field in a meaningful way" (p. 355). Calling DQ a measure of cognitive complexity and sophistication and using his new DQ criteria, Exner reported interscorer reliability coefficients in the 94% to 95% range.

A validity study of DL and DQ (Ridley & Bayton, 1983) used the Wechsler Intelligence Scale for Children-Revised (WISC-R; Wechsler, 1974) with a clinical sample of 134 lower to lower-middle class Black children. The study concluded that DL and DQ were positively correlated ($r = .70$, $p < .001$), and that weighted DQ scores were correlated with age ($r = .45$, $p < .001$), Full Scale ($r = .34$, $p < .001$), Verbal and Performance IQs ($rs = .31$ and .27, respectively, $ps < .001$), and the Verbal Comprehension and Perceptual Organization intelligence factors ($rs = .35$ and .34, respectively, $ps < .001$).

Our study examined the relationship between Rorschach DQ scores and the WAIS-R. Of particular interest was the relationship between DQ scores as measures of cognitive development and the ability structures represented by WAIS-R intelligence factors and IQs. Our overall interest was to determine whether DQv/+ responses represent actual perceptual synthesis (like DQ+ responses). A final objective of the study was to determine whether DQ, as

developed by Exner, continues to represent Friedman's operationalization of Werner's orthogenetic principle, namely, a developmental continuum of perceptual differentiation. Previous work examined the relationships between DL, DQ, and the WISC-R (Ridley & Bayton, 1983) and DL and the WAIS (Greenberg & Cardwell, 1978). Although the WAIS and WAIS-R are fundamentally similar, several studies have demonstrated the consequential differences between the two tests (Mishra & Brown, 1983; Wechsler, 1981). The studies previously cited utilized clinical samples. In contrast, this study utilized a sample of nonclinical, demographically middle-class subjects, with a broad, representative IQ range and stable frequency distributions for intelligence factor and IQ measures.

METHOD

Subjects

Subjects for this study were undergraduate psychology volunteers who received course credit for their participation. The sample was composed of 125 subjects, including 37 men, 82 women, and 6 who did not state their gender. Mean age for the group was 18.95 years (SD = 1.99) with a range of 17–31 years. The sample was 70% White, 8% Black, 7% Oriental, 6% Hispanic, and 9% other. Table 1 summarizes descriptive statistics for WAIS-R data.

Procedure

Subjects were administered the WAIS-R and Rorschach as part of a graduate-level personality assessment practicum. The tests were administered by clinical psychology graduate students under supervision of the first author. Test administrations were conducted under standard conditions according to manual instructions for the WAIS-R (Wechsler, 1981) and those included in *A Rorschach Workbook for the Comprehensive System* (Exner, 1985).

Rorschachs were rescored for location and DQ using criteria from Exner (1985) by the second author, an advanced graduate student in clinical psychology. A random sample of protocols (n = 40) was selected and rescored by the first author and interscorer reliability coefficients were calculated for DQ (95%) and location (97%). Three WAIS-R intelligence factor scores were calculated following standard practice (Aiken, 1987; Cohen, 1957): Verbal Comprehension (VC; Information, Comprehension, Similarities, and Vocabulary subtests), Perceptual Organization (PO; Picture Completion, Block Design, and Object Assembly subtests), and Freedom From Distractibility (FD; Arithmetic, Digit Span, and Digit Symbol subtests). Wilensky's (1959) summary score method was used to obtain overall scores for DQ.

TABLE 1
Descriptive Statistics for WAIS-R Subtests, IQs, and Intelligence Factors

Variable	*M*	*SD*	*Range*
WAIS-R Subtests			
Verbal:			
Information	9.81	2.10	6–15
Digit Span	10.78	2.18	6–15
Vocabulary	10.28	2.32	6–18
Arithmetic	10.07	2.26	5–15
Comprehension	11.35	2.51	6–18
Similarities	10.59	2.25	5–16
Performance:			
Picture Completion	9.69	2.39	4–17
Picture Arrangement	10.48	2.51	5–17
Block Design	11.19	2.59	4–17
Object Assembly	10.20	3.09	3–18
Digital Symbol	11.56	2.26	2–19
WAIS-R IQs			
Verbal IQ	109.59	11.25	82–132
Performance IQ	106.56	12.47	79–136
Full Scale IQ	109.25	11.34	84–138
WAIS-R Intelligence Factors			
Verbal Comprehension	10.51	1.71	6.25–13.50
Perceptual Organization	10.33	2.14	5.00–15.33
Freedom From Distractibility	10.81	1.36	7.33–14.33

RESULTS AND DISCUSSION

A preliminary consideration in data analysis was to ascertain the presence of sex differences in DQ and WAIS-R factor and IQ scores. A nonsignificant test of the equality of covariance matrices (Box's M test), $F(15, 18254) = 1.308$, $p = .19$, ruled out the presence of sex differences. Data were subsequently analyzed as one group. Table 2 presents descriptive statistics for Rorschach DQ data.

The next procedure involved examining whether DQ reflects Friedman's operationalization of Werner's "orthogenetic principle" (i.e., does it represent a developmental continuum of perceptual differentiation?). After determining that response productivity (R) was not correlated with either DQ scores of WAIS-R factor and IQ scores, six stepwise multiple regression analyses were conducted, with WAIS-R intelligence factors (VC, PO, and FD) and IQs as criterion variables and DQ scores as predictors. Table 3 presents multiple regression summary data.

What is most notable in Table 3 is that W+ is the only DQ variable which consistently accounted for significant variation in the factor and IQ scores. The Do score, weighted negatively, was found to be predictive in relation to the PO

TABLE 2
Descriptive Statistics for Rorschach Data

Variable	*M*	*SD*	*Range*
R	22.82	8.38	10–52
W+	3.50	2.68	0–12
Wo	4.58	2.52	0–17
Wv/+	.44	.73	0–4
Wv	.71	1.13	0–5
D+	2.54	1.90	0–10
Do	5.40	5.17	0–22
Dv/+	.15	.44	0–3
Dv	.23	.53	0–2
Dd+	.90	1.12	0–6
Ddo	2.16	2.85	0–15
Ddv/+	.13	.41	0–2
Ddv	.14	.41	0–2
DQ+	6.94	3.34	1–18
DQv/+	.72	.94	0–5
DQo	12.14	7.70	2–42
DQv	1.08	1.37	0–6
S+	.85	.99	0–4
So	1.74	1.70	0–7

TABLE 3
Multiple Regression Summary Table

Criterion	*Predictor*	*R*	R_2	*Sig*	*Beta*
FSIQ	W+	.26	.066	.005	.26
VIQ	W+	.18	.031	.058	.18
PIQ	W+	.26	.070	.004	.26
VC	–	–	–	–	–
PO	W+	.32	.102	.000	.32
	Do	.39	.152	.005	−.26
FD	W+	.26	.065	.005	.26

Note. WAIS–R Full Scale IQ; VIQ = WAIS–R Verbal IQ; PIQ = WAIS–R Performance IQ; VC = Verbal Comprehension factor; PO = Perceptual Organization factor; FD = Freedom From Distractibility factor.

factor, accounting for 11% of the variance. It is possible to conclude from these analyses that Exner's DQ scores do not represent a continuum of perceptual complexity and differentiation. Rather DQ may be better conceptualized in two modes: complex, represented by the W+ response, and simple, represented by the Do response.

In order to examine the specific associations between DQ scores and WAIS-R factor and IQ scores, Pearson correlations were computed. The results are presented in Table 4. These data provide further evidence that complex whole responses (W+), the unelaborated common detail response (Do), and to a lesser extent, the unelaborated unusual detail response (Ddo), were the only DQ scores that correlate with WAIS-R measures. One might surmise from Tables 3 and 4 that complex whole responses tap an ambitious, combinatorial visual-perceptual operation, a finding which is consistent with previous investigations (Allison & Blatt, 1964; Blatt & Allison, 1963; Marsden, 1970; Smith, 1981). On the other hand, the Do response, notable for its perceptual "economy" and simplicity, is negatively correlated with WAIS-R measures tapping visual-perceptual abilities. These findings (see Table 5) are reflected in the correlations between Do and the WAIS-R subtests making up the PO factor (Picture Completion: $r = -.26$, $p = .005$; Block Design: $r = -.31$, $p < .001$; Object Assembly: $r = -.25$, $p = .006$).

Weak but significant positive correlations were found between S+ responses and PIQ, the PO factor, and the Object Assembly subtest. This finding is not

TABLE 4
Pearson Correlations for Developmental Quality and WAIS-R Intelligence Factors and IQs

DQ Score	*VC*	*PO*	*FD*	*VIQ*	*PIQ*	*FSIQ*
W+	.11	.32***	.26**	.18**	.26**	.26**
Wv/+	.07	.12	−.03	.03	.07	.05
Wo	−.05	−.01	−.05	−.14	−.05	.12
Wv	−.05	−.06	−.08	−.08	−.12	−.11
D+	−.02	−.09	.06	−.00	−.08	−.04
Dv/+	−.06	−.10	−.05	−.04	−.12	−.08
Do	−.14	−.34***	−.03	−.24**	−.18**	−.24**
Dv	−.07	−.14	.08	−.06	−.13	−.10
Dd+	−.03	.01	.02	.02	.03	.03
Ddv+	.05	.00	.08	.07	.02	.05
Ddo	−.22*	−.12	.04	−.18*	−.11	−.16
Ddv	−.17	−.17	.02	−.15	−.15	−.17
So	−.06	−.04	−.02	−.12	−.07	−.08
S+	.08	.20*	.08	.06	.18*	.14
DQ+	.07	.21*	.25**	.15	.17	.20*
DQv/+	.05	.04	.00	.04	.00	.02
DQo	−.19*	.28**	−.01	−.23*	−.24**	−.26**
DQv	−.12	−.16	−.03	−.13	−.19*	−.18*

Note. All correlations are two-tailed.
*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 5
Pearson Correlations for Developmental Quality and WAIS-R Perceptual Organization Subtests

DQ Score	*Picture Completion*	*Block Design*	*Object Assembly*
W+	.22*	.27**	.27**
Wv/+	.07	−.00	.10
Wo	−.05	−.00	.02
Wv	.07	−.11	−.09
D+	−.02	−.11	−.09
Dv/+	−.03	−.07	−.13
Do	−.26**	−.31***	−.25**
Dv	−.05	−.13	−.15
Dd+	−.05	.06	.02
Ddv/+	.05	−.01	−.01
Ddo	−.18*	−.07	−.05
Ddv	−.08	−.19*	−.15
DQ+	.15	.16	.19*
DQv/+	.06	.00	.05
DQo	−.26**	−.18*	−.23*
DQv	.01	−.17	−.20*
So	−.16	.06	−.01
S+	.11	.16	.21*

Note. All correlations are two-tailed.
*$p < .05$. **$p < .01$. ***$p < .001$.

surprising because the S+ response is a combinatorial response and occurs in association with W+ ($r = .21$, $p < .05$) and Dd+ ($r = .29$, $p < .001$). Finally, it is of interest to note that v/+ DQ scores were not correlated with factor and intelligence scores, a finding which raises doubt about whether DQv/+ responses represent a synthesizing perceptual operation.

In order to determine whether DQv/+ responses represent an actual synthesizing operation, similar to DQ+ responses, distributions of IQ and intelligence factors were quartiled and the upper and lower quartiles were analyzed. Synthesis responses (DQ+) were more frequent in the upper quartile of the Performance IQ and PO factor. On the other hand, no differences were observed for DQv/+ scores. Interestingly, DQo and DQv were more frequent in the lower quartiles for IQs and the VC factor.

Several considerations emerge from the findings, particularly concerning the conceptual relationship between DL and DQ. Exner, in creating DQ, removed dimensions which were apparently related to WAIS-R measures of verbal fluency. In contrast to DL, as reported by Greenberg and Cardwell (1978), DQ

does not appear to be saturated with a general intelligence factor. The results support Ridley and Bayton's (1983) conclusion that DL and DQ appear to be related primarily to different cognitive abilities.

DQ is a purer and simpler variable than DL, which appears to tap a holistic–combinatorial perceptual ability or visual–perceptual problem-solving skill in which complex whole responses make the most significant contribution. DQ may reflect not only a perceptual ability, but a motivational factor as well. This ability, in which an organized whole is analyzed and synthesized into its constituent parts, bears a strong similarity to the construct of perceptual field independence (Goodenough & Karp, 1961). It may be argued, based on these findings, that DQ is not an operationalization of Werner's orthogenetic principle. Thus, developmental quality, at least in the sense that Werner or Friedman intended it, may be something of a misnomer.

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