JOURNAL OF PERSONALITY ASSESSMENT, *81*(1), 149–156


# Refinements in the Rorschach Ego Impairment Index Incorporating the Human Representational Variable

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The Ego Impairment Index (EII; Perry & Viglione, 1991) is a composite measure of psychological impairment and thought disturbance developed from the empirical and theoretical literature on the Rorschach. In this article, we summarize reliability and validity data regarding the EII. Our major goal was to present the rationale and empirical basis for recent refinements in the EII. Among the subcomponents of the original EII was the Human Experience variable (HEV), which has recently been revised and replaced with the Human Representational variable (HRV; Viglione, Perry, Jansak, Meyer, & Exner, 2003). In this study, we replaced the HEV with the HRV to create the EII–2. This was accomplished by recalculating the factor coefficients with a sample of 363 Rorschach protocols. We present additional validity data for the new EII–2. Research recommendations and interpretive guidelines are also presented.

The Ego Impairment Index (EII; Perry & Viglione, 1991) has emerged as a measure of psychological impairment and thought disorder. It is a theoretically derived, composite variable obtained from factor analysis of Comprehensive System (CS; Exner, 1993) variables. The EII was intended to provide data regarding deficits in ego functions (reality testing, reasoning processes, and the quality of object relations) beyond that which can be obtained via self-report and symptom rating scales. Perry, Viglione, and Braff (1992) suggested that the Rorschach offers an optimal opportunity to measure impairment because it induces the respondent to use available cognitive, affective, and human or representational resources to organize a response to an ambiguous and complex task. The Rorschach instructions, administration context, and stimuli offer the respondent very little guidance and structure for organizing and making choices among contradictory and interconnected response alternatives (Viglione & Perry, 1991). Accordingly, the task minimizes extraneous influences on the test responses so that the respondent's problem-solving style and idiosyncrasies, including thinking disturbances, influence test responses greatly (Kleiger, 1999).

In creating the EII, Perry and Viglione (1991) drew from Beres's (1956) model of ego assessment to delineate ego function components of psychological disturbance. Beres's model distinguished among six interrelated ego functions. The EII incorporated five subcomponent variables selected to correspond with one or more of these ego functions. Each of the variables, in various forms, has shown empirical associations with impairment and psychological disturbance (e.g., see summaries in Exner, 1993; Perry & Viglione, 1991; Viglione, 1999; Weiner, 1966). We describe the five EII subcomponent variables briefly following:

1. Distorted Form Quality (FQ–) measures perceptual inaccuracy or poor reality testing.
2. The weighted sum of the six cognitive Special Scores (WSum6) measures thought disturbance in various forms.
3. Critical Contents (formerly referred to as "Derepressed" contents) are images associated with needs and urges that are typically inhibited, minimized, or indirectly expressed in adaptive thinking,

Rorschach responses, and social discourse. They include anatomy, blood, explosions, fire, food, sex, X-ray contents, and both aggressive and morbid Special Scores.[1]

4. Distorted Human Movement responses (M–) are another measure of thought disturbance but unlike WSum6 capture distortions in interpersonal perception or object representations.
5. The Good-to-Poor Human Experience variable (HEV) measures positive/intact versus negative/problematic aspects of Human Representational responses (Viglione, Perry, Jansak, Meyer, & Exner, in press). It incorporates the following dimensions: (a) accurate and conventional versus distorted, (b) benevolent versus malevolent and aggressive, (c) intact versus damaged, and (d) realistic and logical versus confused and illogical. The HEV was designed to improve on the conceptual and psychometric weaknesses of similar Rorschach measures. In a recent article (Viglione et al., in press), the HEV was modified in an attempt to enhance its validity and psychometric properties. It was renamed the Human Representational variable (HRV).

Perry and Viglione (1991) speculated that the shared association between these five variables would correspond to psychological disturbance. To test this idea, the five variables were factor analyzed using Rorschach data generated by Haller (1982; Haller & Exner, 1985) from patients with depression. Before initiating the factor analysis, the number of responses per record (R), as a potential moderator variable, was regressed out of each of these five variables. A principal components factor analysis was then performed on the residuals. As anticipated, one factor emerged from the Haller (1982) sample, and the resulting factor score coefficients became part of the weighted sum for calculating the EII.

Studies suggest that the EII is a highly robust and replicable factor. In the original research (Perry, 1989) a similar factor emerged with a cross-validation sample of individuals with depression. Also, Perry et al. (1992) generated a similar factor with data from 52 patients with schizophrenia. This factor correlated with the original EII, $r = .98$.

In addition to factorial validity, adequate reliability has been demonstrated. As with many Rorschach variables, interrater reliability is impressive. High intraclass correlations of .93 to .98 for the EII subcomponents were reported in the original EII study (Perry & Viglione, 1991). Temporal consistency reliability has also been strong: EII test–retest correlations across 9 weeks was $r = .78$ despite treatment with antidepressant medication and symptomatic change (Perry & Viglione, 1991). In contrast, the corresponding correlation for the Beck Depression Inventory (Beck, 1967) was $r = .39$. Attempts were made to locate the 49 individuals from the original Perry and Viglione developmental sample, and 17 were retested 5 years after the original Rorschach was administered (Perry, McDougall, & Viglione, 1995). The EII rank order correlation for this long retest interval was $r = .68$. This finding suggests both that the measure possesses considerable temporal consistency reliability and that the underlying trait is stable over long periods. Perry, McDougall, et al.'s (1995) study also produced acceptable to excellent interrater reliability coefficients at the response level, with kappas ranging from .63 to .89 for EII subcomponents.

In the original EII validation study, Perry and Viglione (1991) addressed predictive validity by monitoring symptomatic changes among patients who met *Diagnostic and Statistical Manual of Mental Disorders–III* (American Psychiatric Association, 1980) diagnostic criteria for major depression with melancholia. As described previously, the factor weights were first generated from a separate sample to cross-validate the derived factor formula with this second sample of individuals with depression. Perry and Viglione hypothesized that there would be a relationship between EII scores and response to treatment. In other words, patients with depression who evidenced psychological impairment as indicated by higher EII scores would be less likely to benefit from tricyclic antidepressant treatment than would patients with depression who had lower EII scores. The results supported this hypothesis: EII scores predicted overall outcome following 9 weeks of treatment. The average effect size for predicting two different outcome measures was $r = .48$. The HEV emerged as the strongest predictor of treatment outcome, outperforming the other EII subcomponents as well as self-report and symptom rating measures.

Because Rorschach responses are observable samples of perceptual and cognitive problem-solving behaviors, it was assumed that the EII might also measure thought disturbance (Perry et al., 1992). This hypothesis is consistent with a long history of using the Rorschach in research and in practice for this purpose (Acklin, 1999; Exner, 1974, 1993; Holzman & et al., 1974; Kleiger, 1999; Viglione, 1999; Weiner, 1966) and coincides with the emphasis on the Rorschach as a behavioral problem-solving task involving cognitive processes (Exner, 1993; Viglione, 1999; Perry et al., 1992). Therefore, the index, originally conceived as a measure of overall psychological impairment, was extended to the study of patients with schizophrenia and psychoses. Thought disorder is a hallmark feature of such patients but can be difficult to assess through highly structured interviews and self-report methods. The validity of such methods is a function of the respondent's awareness of the disturbed thinking and the willingness to discuss it openly.

Within a sample of individuals with schizophrenia ($N = 34$; Perry et al., 1992), the EII correlated with measures that are commonly thought to tap into psychotic processing such as the Eckblad–Chapman Scale of Magical Ideation

[1]The original study (Perry & Viglione, 1991) omitted the morbid Special Score as a Critical Content. The reason for this decision was our concern about a possible confounding of the EII and outcome because morbid scores are associated with depression. All other research since that time has included the morbid content score with the EII.

(Eckblad & Chapman, 1983; $r = .41$) and Scales 6 ($r = .47$), 8 ($r = .41$), and Ego Strength ($r = -.44$) from the Minnesota Multiphasic Personality Index (MMPI; Hathaway & McKinley, 1943). The EII also differentiated between smaller groups of paranoid ($n = 14$) and nonparanoid ($n = 12$) schizophrenic patients who were matched on age and education. As expected, the nonparanoid (undifferentiated and disorganized subtypes) patients scored higher on the EII, thus demonstrating more impairment (Cohen's $d = 1.37$; $r = .56$). The CS Schizophrenia Index did not differentiate these two groups, suggesting some incremental validity for the EII.

Perry, Moore, and Braff (1995) examined gender differences on three measures of thought disturbance among patients with schizophrenia. Male and female patients demonstrated similar degrees of thought disturbance on the standard symptom-rating scales but the male patients had higher EII scores (Cohen's $d = .58$). This finding is consistent with the widely held hypothesis that male patients with schizophrenia have a more "malignant" form of the disease. The researchers also found a strong relationship between the EII and a gross measure of social competency ($r = -.42$). Observer and interview rating scales of thought disorder were not associated with social competency or with gender, again suggesting incremental validity for the EII.

Among patients with schizophrenia, Perry and Braff (1994) demonstrated a relationship between information processing deficits and disturbances in thinking as measured by the EII and its subcomponent variables. The EII was correlated in the expected direction with visual backward masking ($r = -.40$, $p < .01$; $N = 35$), auditory prepulse inhibition ($r = -.26$, $p > .10$; $N = 39$), and tactile prepulse inhibition ($r = -.23$, $p > .10$; $N = 35$). In the Perry and Braff (1994) study, Poor Human Experience (PHE) an EII subcomponent, was consistently and strongly associated with these tasks. PHE was correlated with visual backward masking ($r = -.42$, $p < .01$; $N = 35$), auditory prepulse inhibition ($r = -.37$, $p < .025$; $N = 39$), and tactile prepulse inhibition ($r = -.35$, $p < .025$; $N = 35$). Interview, or observationally based thought disorder measures, and self-report were not associated with these neurophysiological information-processing measures. None of the 12 relevant self-report or interview correlations were significant at $p < .05$, and they ranged in magnitude from $r = -.27$ to $r = .05$, with negative correlations being in the expected direction. The mean correlation was $r = -.16$.

The association between the EII and neurophysiological information processing measures has been partially replicated in a sample of patients with schizotypal personality disorder (Cadenhead, Perry, & Braff, 1996). In this small study with limited power ($n = 13$), visual backward masking was associated with the EII ($r = -.78$, $p < .01$) but was not significantly associated with the PHE ($r = -.50$, $p < .06$).

These studies, typical of work with thought disorder measures, have addressed the relationship between predictors and criteria collected at two different points in time. When interpreting these nonsimultaneous data, the researchers have concluded that a causal or contemporaneous relationship exists between these two data sets. To eliminate some of the doubt in attributing thought disorder to information-processing problems, Rorschach responses and information-processing measures were collected in a near-simultaneous computerized procedure (Perry, Geyer, & Braff, 1999). In this small study with limited power ($N = 21$), information-processing deficits correlated reasonably well with subcomponents of the EII. The EII subcomponents were Form Quality, cognitive Special Scores (WSum6), and Critical Contents, all divided by the number of responses. Associations between these EII subcomponents and information-processing deficits were moderate to large (three nonsignificant and three significant correlations ranging from $r = .35$ to $r = .78$, with a mean $r = .58$).[2] In contrast, observer and interview measures of thought disorder were not correlated with information-processing deficits. All 10 of these non EII correlations were nonsignificant and only 6 of the 10 were in the expected direction.

A number of studies have associated the EII with psychological impairment. Adrian and Kaser-Boyd (1995) reported higher scores among inpatients than outpatients (Cohen's $d = .64$, $r = .28$; $N = 85$) but did not find a significant difference between psychotic and nonpsychotic individuals (Cohen's $d = .47$, $r = .23$, $p = .09$; $N = 85$). Dawes (1999) examined a data set provided by Meyer and Resnick (1996). In Dawes's analysis, and in a third analysis of these data by Viglione and Hilsenroth (2001), the EII provided unique variance beyond MMPI variables (Goldberg Index and mean scale elevation) in the prediction of psychological impairment as measured by the severity of psychiatric diagnosis (incremental $r = .24$). These findings suggest incremental validity for the EII.

Table 1 summarizes data from published studies and dissertations derived from diagnostic groups and nonpatient, outpatient, or inpatient status. The samples are ordered by the magnitude of their average EII score, with more disturbed EII values appearing lower in the table. Examining the types of samples associated with high or low scores, the pattern of results supports interpreting the EII as a general measure of psychological impairment, grossly defined in the research by the status and diagnosis of the groups. As expected, there has been considerable variability in level of impairment and EII scores within any of these groups defined grossly by diagnoses or other grouping variables.

In summary, the EII has demonstrated strong reliability and validity. Findings suggesting incremental validity have also emerged. The research supports the conclusion that the EII is associated with severity of psychological impairment and that it taps into the cognitive dysfunction that is observed

[2]These correlations were altered so that positive correlations were in the expected direction. Also, the Rorschach was administered by computer in the Perry, Geyer, and Braff (1999) study. This procedure, along with nearly simultaneous measurement of neurophysiological information-processing variables, led to restrictions in response productivity. In the Perry et al. (1999) study, EII results were not reported.

**TABLE 1**
**EII Descriptive Data for Adults Published in Journal Articles or Dissertations**

| Source | Sample Description | N | EII | |
|---|---|---|---|---|
| | | | *M* | *SD* |
| Netter, 1990 | Nonpatient volunteers | 20 | –0.66 | 1.12 |
| Perry & Viglione, 1991 from Haller & Exner, 1985 | Inpatients with depression symptoms | 50 | 0.00[a] | 1.00[a] |
| Perry & Viglione, 1991 | Outpatients, depression diagnosis | 49 | 0.08 | 0.96 |
| Auslander, 2000 | Elderly nonpatients, *M* age = 75 | 45 | 0.19 | 0.83 |
| Adrian & Kaser-Boyd, 1995[b] | Outpatients | 24 | 0.23 | 0.93 |
| Auslander, 2000 | Elderly schizophrenic patients, stabilized on medications, some with late-life onset, *M* age = 60 | 44 | 0.25 | 1.08 |
| Perry, McDougall, & Viglione, 1995 | Perry & Viglione's (1991) outpatients 5 years later | 17 | 0.30 | 0.85 |
| Ingham, 1993 | Women whose military husbands were about to deploy overseas | 68 | 0.41 | 1.19 |
| Adrian & Kaser-Boyd, 1995[b] | Clinical team diagnosis, nonpsychotic; inpatients and outpatients | 48 | 0.52 | 1.3 |
| Cadenhead, Perry, & Braff, 1996 | SCID diagnosed schizotypal personality disorder | 13 | 0.58 | NA |
| Adrian & Kaser-Boyd, 1995[b] | Inpatients | 61 | 1.1 | 2.1 |
| Adrian & Kaser-Boyd, 1995[b] | Clinical team diagnosis, major depression; inpatients and outpatients | 22 | 1.1 | 1.9 |
| Adrian & Kaser-Boyd, 1995[b] | Clinical team diagnosis, psychotic; inpatients and outpatients | 37 | 1.3 | 2.4 |
| Perry & Braff, 1994[c] | Schizophrenia from structured interview | 52 | 1.3 | NA |
| McDougall, 1996 | Schizophrenia from structured interview | 40 | 1.55 | 2.16 |
| Perry, Viglione, & Braff, 1992 | Schizophrenia from structured interview | 34 | 1.6 | NA |
| Netter, 1990 | Inpatient, schizophrenia diagnosis from locked residential-care ward | 20 | 1.62 | 1.90 |

*Note.* EII = Ego Impairment Index; SCID = Structured Clinical Interview for *Dianostic and Statistical Manual of Mental Disorders—III–R*; NA = not applicable. [a]These descriptive data are for the original factor scores, which by definition set the mean equal to zero and the standard deviation equal to one. [b]The samples from Adrian and Kaser-Boyd (1995) study are overlapping in that respondents are contained in one of the setting groups (i.e., inpatient or outpatient) and one or more of the disorder groups (i.e., psychotic or nonpsychotic; depressed). [c]Includes 34 participants from Perry, Viglione, and Braff (1992).

among patients with schizophrenia and/or psychosis. From this perspective, the EII appears to measure thought disorder across a broad range of cognitive and psychological functioning (Kleiger, 1999; Perry, Minassian, Cadenhead, Sprock, & Braff, 2003).

As noted in the beginning of this article, the HEV is one of the five subcomponents of the EII. The HEV has been replaced by the HRV, which is a slightly modified and psychometrically improved variable (Viglione et al., in press). The challenge in this study was to preserve the EII while replacing the HEV subcomponent with the HRV. To accomplish this recalculation of the EII to create the EII–2, we used multiple regression analysis with a large and diverse sample to produce an equivalent, recalculated EII–2. We present that analysis here. We also present other data relevant to the psychometric characteristics and validity of the EII–2.

## METHOD AND RESULTS

### Participants

As described in the Viglione et al. (in press) article addressing the development of the HRV, we assembled a sample of 389 Rorschach records from adults in eight subgroups. These groups were selected to represent a diverse range of impairment and administration contexts and were matched as closely as possible to the 1997 to 1998 estimated census data for age and ethnicity. The sample was 50% female participants and 33% minority participants, with 20%f the sample being 25 years of age or less and 12% being older than 54 years of age. As described in the HRV article (Viglione et al., in press), the sample closely resembles the U.S. population characteristics in terms of age and ethnicity, but high school educated individuals were slightly underrepresented. The eight subgroups were selected to provide a great variety of psychological impairment and examination contexts. They include nonpatients and character disorder patients from CS reference samples (Exner, 2002), psychiatric outpatients and inpatients (Meyer, 1999), individuals with depression (Jansak, 1996), community nonpatients (Cassella, 1999; Green, 1995; Viglione, Gaudiana, & Gowri, 1997), offenders (Montemagni, 2003; DeLucas, 1997), and patients with schizophrenia (Perry et al., 1992). Because the Rorschachs were administered at many different sites by numerous administrators, the composite sample maximizes external validity across examiners and institutions. Of these records, 363 contained more than 13 responses and were retained in the final sample. Twenty-five were eliminated because they had fewer than 14 responses, and 1 contained an input error that the computer would not process.[3]

[3]Some of the subgroup data files included only summaries for age, ethnicity, and education. In other words, for these subgroups, demographic data were not stored by individual respondent within the computerized Rorschach summary files but instead were reported for the entire subgroup. Accordingly, we were unable to identify which participants were lost when we eliminated the records with less than 14 responses and thus cannot present the demographic information for the sample of 363. The great majority of the records with fewer than 14 responses came from the sample of individuals

We calculated new weights for the EII–2 subcomponents while retaining the distributional qualities of the original EII. To do so, we used the original EII and its subcomponents within a multiple regression to generate new coefficients. Thus, the predictors were FQ–, WSum6, Critical Contents, M–, Poor HRV, Good HRV, and R as a control variable, and the original EII was the criterion variable. The resultant unstandardized coefficients, presented in Table 2, maximized the association between the recalculated EII–2 and original EII. Appendix A contains a calculation example using these coefficients. The EII–2 correlated at $r = .99$ with the original EII. Table 3 contains the descriptive statistics for both the EII and the new EII–2. We also developed a simplified hand calculation routine for the EII–2. It is described in Appendix B and descriptive data are included in Table 3 for comparison purposes.

Additional analyses addressed the factorial stability of the EII–2. First, with our sample of 363, we repeated the same procedures used to produce the original EII (Perry & Viglione, 1991). Accordingly, we regressed out R from the EII–2 subcomponents, using the new HRV rather than the original HEV. Then, as done by Perry and Viglione for the EII, we factor analyzed the residuals. The first factor accounted for 59% of the variance among the EII–2 subcomponents and was correlated .952 with the original EII and .958 with the EII–2. This analysis again supported the position that the EII and EII–2 correspond to a robust and easily replicable Rorschach factor. A second analysis addressed shrinkage and cross-validation of the EII–2. We assembled an independent sample of 323 Rorschach records from psychiatric patients (Meyer, 1999). All records contained more than 14 responses and had computerized data files available. In this sample, the EII–2 correlated almost perfectly with the original EII ($r = .993$, rank order $r = .984$). Descriptive data for the EII and EII–2 were also very similar (EII, $M = 1.62$, $SD = 2.27$; EII–2, $M = 1.58$, $SD = 2.26$).

As a test of concurrent validity for the EII–2, we rank ordered the subgroups in our sample by estimating their psychological impairment. These impairment estimates are summarized in Table 4. Such estimates, like some of the previous indicators of psychological impairment (Dawes, 1999; Perry, McDougall, et al., 1995; Perry, Moore, et al., 1995; Viglione & Hilsenroth, 2001) roughly approximate the construct of psychological impairment so that the EII–2 correlations were limited by the validity of the criterion. In other words, gross criteria of psychological impairment such as those available in these group rank orderings were not highly correlated with the true underlying construct of impairment. The EII–2 rank order correlation with impairment was .47, which is impressive given the limitations of the criterion. In fact, one might speculate that the theoretical correlation between the criterion and the true construct of psychological impairment might not be much more than .47. Thus, a correlation of .47 may approach the maximum possibility with this particular gross criterion. Indeed, Dawes (1999), with a similar criterion from the Meyer and Resnick (1996) data set, used more Rorschach and MMPI predictor variables yet only achieved a maximum correlation of .492 with multiple regression techniques.

with schizophrenia. The sample composition is described in more detail in the HRV development article (Viglione, Perry, Jansak, Meyer, & Exner, in press).

**TABLE 2**
**Factor Score Coefficients for the EII and EII–2**

| *Original EII Based on HEV* | | *Revised EII–2 Based on HRV* | |
|---|---|---|---|
| *Subcomponent* | *Coefficient* | *Subcomponent* | *Coefficient* |
| FQ– | .136 | FQ– | .141 |
| WSum6 | .050 | WSum6 | .049 |
| Depressed | .068 | Critical Contents | .072 |
| M– | .208 | M– | .198 |
| Poor HEV | .108 | Poor HR | .117 |
| Good HEV | (–.160) | Good HR | (–.104) |
| R | (–.062) | R | (–.066) |
| Constant | (–.049) | Constant | (–.038) |

*Note.* EII = Ego Impairment Index; HEV = Human Experience Variable; HRV = Human Representational Variable.

**TABLE 3**
**Descriptive Data for EII and EII–2**

| *Variable* | *EII* | *EII–2* | *EII–2 Hand Calculation*[a] |
|---|---|---|---|
| *M* | .39 | 0.40 | 0.34 |
| *SD* | 1.97 | 1.96 | 1.91 |
| Skew | 2.47 | 2.61 | 2.64 |
| Kurtosis | 9.10 | 9.74 | 9.99 |
| Min | –2.72 | –2.28 | –2.25 |
| 5th percentile | –1.71 | –1.53 | –1.54 |
| 25th percentile | –0.84 | –0.76 | –0.76 |
| Mdn | –0.01 | –0.03 | –0.08 |
| 75th percentile | 1.05 | 0.95 | 0.86 |
| 95th percentile | 3.94 | 4.06 | 3.94 |
| Max | 11.79 | 11.78 | 11.64 |

*Note.* $N = 363$. EII = Ego Impairment Index.
[a]The hand-calculation version of the EII–2 is described in Appendix B.

## Discussion

The original EII and recalculated EII–2 are almost exactly the same. The original EII incorporates the original HEV, whereas the EII–2 incorporates the HRV. The correlation between the EII and EII–2 approaches $r = 1.0$. When considered alongside the nearly identical distributional properties of the EII and EII–2, the findings suggest that these two indexes are essentially interchangeable.

Furthermore, research has supported the view that the EII–2 measures psychological impairment and thought disturbance, as defined broadly by Kleiger (1999). Thus, it can be used, along with other measures and information, across and within diagnoses to assess impairment expressed

**TABLE 4**
**Descriptive Data and Estimated Impairment Levels for EII–2 Recalculation Sample Subgroups**

| | *CS Reference: Nonpatients* | *Community Volunteers: Nonpatients* | *Community Volunteers: Mild to Moderately Depressed* | *CS Reference: Character Disorders* | *Offenders Mixed*[a] | *Patients* | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | *Outpatient* | *Inpatient* | *Schizophrenic* |
| *N* *R* > 13[b] | 50 | 50 | 40 | 48 | 50 | 50 | 50 | 51 |
| | 50 | 50 | 40 | 48 | 47 | 50 | 50 | 28 |
| *M* | –1.30 | .34 | .38 | –.21 | –.03 | 1.15 | 1.71 | 1.58 |
| *SD* | .47 | 1.27 | .92 | .90 | 1.18 | 2.36 | 2.91 | 2.32 |
| Impairment estimate[c] | 1 | 2 | 3 | 4 | 4 to 6 | 5 | 6 | 7 |

*Note.* EII–2 = Ego Impairment Index–2.
[a]The offender group contains 5 violent offender volunteers (impairment rank = 4) , 3 nonviolent offender volunteers (impairment rank = 5) , and 38 in vivo forensic evaluations without clear evidence of mental disorder (impairment rank = 4) of whom 4 were mentally disordered offenders with severe disorders (impairment rank = 6). [b]*N* = 363, with *R* > 13. [c]Impairment Estimate is the estimated rank order of psychological impairment of the various categories for use as an exploratory criteria with the EII–2 in subsequent analysis.

cognitively in various types of problem-solving and coping activities. Unlike the CS Perceptual Thinking Index (Exner, 2000), it has the advantage of being a continuous variable. It also incorporates a large amount of data relevant to psychological impairment and thought disorder on the test. The research literature summarized in this article has suggested considerable variation in the level of such impairment within diagnoses or within patient or participant class, be it inpatient versus outpatient or offender versus nonoffender. Obviously, one should not assume that individuals within such classes share a single level of impairment.

There are a number of research possibilities regarding the EII–2. First, much of the previous research with the Rorschach, and to some extent with the EII–2, has addressed concurrent validity with diagnostic groups and symptom severity. However, more research needs to be done to delineate the association between the EII–2 and impairments in thinking, problem solving, and coping. This research should use refined behavioral measures of actual thought processes, information processing, decision making, and adaptive functioning. Such research might also incorporate real-life behaviors and coping challenges as criteria to maximize the generalization to everyday functioning.

Second, research should address the EII–2 subcomponents, which would be particularly useful for clinical situations when a single subcomponent score contributes heavily to an EII–2 elevation. By using the EII–2 subcomponent contributions (excluding R, which is a control variable) one can calculate each subcomponent's contribution to the final EII–2 score. The calculation allows one to distinguish among these subcomponents' contributions to the ultimate EII–2 score. (See Appendix A.)[4] Alternatively, research efforts could focus on the occurrence of low EII–2 scores in individuals with disorders (e.g., thought disorders) presumed to include serious psychological impairments. To speculate, such a combination may imply that the individual has some ability to control the expression of the disorder or that the disorder is of a less severe variety. Conversely, researchers could turn their attention to nonpatients who produce elevated EII–2 scores.

Finally, future research should examine the possible role of moderator and collateral variables from both the Rorschach and other sources. Although R is regressed out of the EII–2, there may be subtle nonlinear relationships between EII–2 scores and R in some contexts. In terms of the distribution of scores, this is reflected in considerable positive skew; therefore, in research, one might need to truncate high EII–2 scores at approximately 5 (i.e., retain all data points but change all values greater than 5 to 5) or even less if it is a generally healthy sample. It should also be kept in mind that the EII–2 is primarily a measure of a negative characteristic, and therefore, low scores imply an absence of disturbance or impairment. It is not always clear that such an absence is related to problem-solving strengths. The available literature has suggested that low EII–2 scores with high overall protocol complexity (e.g., Viglione, 1999) would lead to the most sophisticated and flexible problem solving and coping.

Interpretively, high EII–2 values suggest problem-solving failures or ineffective and idiosyncratic thinking in complex and demanding life situations. One would expect that individuals with high EII–2 scores would evidence behavioral dysfunction and failures in adaptation. Research has demonstrated that high EII–2 values are associated with schizophrenic spectrum disorders, psychoses, thought disorder, poor response to treatment, and cognitive dysfunction. However, as it is primarily a measure of negative rather than positive characteristics, it is sensitive to impairment and limitations in thinking in relatively well-functioning individuals as well as in severely disordered individuals. We propose that this broadband index of psychological impairment

[4]Appendix A contains an example demonstrating how to calculate the EII–2. In the example presented in Appendix A, the contribution by FQ– to the EII–2 is 0.423, which is the second largest contribution to the total score. The largest contribution comes from Good HR (–0.936).

**TABLE 5**
**Suggested Overlapping Interpretive Ranges for the EII–2**

| *Range* | *EII–2 Interpretation* |
|---|---|
| < –0.3 | Optimal range—No impairment evident |
| –0.4 to +0.2 | Typical range for nonpatients—No impairment evident |
| +0.0 to +0.6 | Minimum impairment |
| +0.4 to +0.8 | Mild to moderate impairment |
| +0.7 to +1.5 | Moderate to severe impairment |
| > 1.3 | Significant impairment evident |

*Note.* EII–2 = Ego Impairment Index–2.

can be interpreted according to the ranges in Table 5. To ensure that the EII–2 is interpreted on a continuum, the interpretive ranges overlap.

## ACKNOWLEDGMENTS

Thanks to John Exner for providing Rorschach records for this study, and to former students now colleagues, Donna Jansak, Elizabeth Green, Michael Cassella, and Ann DeLucas, who contributed data from their dissertations to the Rorschach research laboratory at the California School of Professional Psychology at Alliant International University. We are grateful to Todd Pizitz, Nicole Taylor, Joseph Obegi, Bridgett Scimone, and Suzanne O'Brien for help in preparing this article.

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Received December 2, 2001
Revised March 11, 2003

## APPENDIX A
## Calculating the EII–2

These calculation procedures for the EII–2 reflect changes in the Human Representational variable (HRV). The EII–2 is a weighted sum and is calculated according to the following example. Note for actual calculations, the example values underlined would be replaced by patient-specific values.

| *Variable Name/Step* | *Step 1: List Raw Values* | | *Step 2: Multiply by Coefficients* | | *Subcomponent Contributions* |
|---|---|---|---|---|---|
| No. of FQ– responses | 3 | × | .141 | = | 0.423 |
| WSum6 | 7 | × | .049 | = | 0.343 |
| Critical Contents[a] | 4 | × | .072 | = | 0.288 |
| M– | 2 | × | .198 | = | 0.396 |
| Poor HRV | 2 | × | .117 | = | 0.234 |
| Good HRV | 9 | × | (–.104) | = | –0.936 |
| *R*[b] | 19 | × | (–.066) | = | –1.254 |
| Step 3: Subtract the constant value of .038: | | | | = | –0.038 |
| Step 4: Calculate the total EII–2 by summing all the subcomponent values: .423 + .343 + .288 + .396 + .234 – .936 – 1.254 – .038 | | | | = | –0.544 |

*Note.* EII–2 = Ego Impairment Index–2.
[a]Sum of An, Bl, Ex, Fi, Fd, Sx, Xy, AG, MOR. [b]The number of responses (*R*) is included to minimize its effects on the EII–2.

## APPENDIX B
## Simplified Hand Calculation of the EII–2

To assist those who calculate these variables by hand, a simplified hand-calculated EII–2 version is presented. Within the reference sample of 363, the EII–2 was correlated at $r > .9995$ with the hand calculated version. The EII–2 hand-calculated score averages about .05 less than the actual EII–2 score. About 85% of the hand-calculated scores are within .10 of the actual EII–2 scores and only 1% are larger than the EII–2 score. Thus, the hand-calculated score produces small underestimates but rarely overestimates the EII–2. Descriptive data for the hand-calculated version are presented in Table 3. The example scores used in Appendix A are also used to illustrate the following hand-calculated example. For actual calculations, the example values underlined would be replaced by client-specific values.

| *Variable Name/Step* | *Step 1: List Raw Values* | | *Step 2: Multiply by Coefficients* | | *Subcomponent Contributions* | | *Subtotal/Total* |
|---|---|---|---|---|---|---|---|
| No. of FQ– responses | 3 | × | 14 | = | 42 | | |
| WSum6 | 7 | × | 5 | = | 35 | | |
| Critical Contents[a] | 4 | × | 7 | = | 20 | | |
| M– | 2 | × | 20 | = | 40 | | |
| Poor HRV | 2 | × | 10 | = | 24 | | |
| Step 3: Compute Subtotal | | | | | | = | 165 |
| Good HRV | 9 | × | 10 | = | 90 | | |
| R[b] | 19 | × | 7 | = | 175 | | |
| Step 4: Compute GHR and R subtotal | | | | | | = | 223 |
| Step 5: Subtract Step 4 subtotal from Step 3 subtotal: 223 – 165 | | | | | | = | –58 |
| Calculate the EII–2 by dividing the Step 5 total by 100: 58/100 | | | | | | = | –.58 |

*Note.* HRV = Human Representational Variable; EII–2 = Ego Impairment Index–2.
[a]Some data sources combined these groups. [b]Includes 6 offenders with severe psychiatric disorders.