Psychological Test Signs of Borderline Personality Disorder: A Review of the Empirical Literature

John Gartner, Stephen W. Hurt, and Alison Gartner

New York Hospital-Cornell Medical Center, Westchester Division

Recent empirical work aimed at identifying test signs of borderline personality disorder is reviewed. The review focuses on commonly employed clinical tests, including the Wechsler Adult Intelligence Scale (WAIS), the Rorschach, and the Minnesota Multiphasic Personality Inventory (MMPI). Possible test signs are considered in relation to their sensitivity to and specificity for the diagnosis and in relation to the criteria of DSM-III, which define the disorder. Although consistent patterns of potentially useful test signs have begun to appear, methodological difficulties have hampered any subsequent development of clinically useful indices. Greater attention to sample size and its composition and definition as well as demonstrations of adequate reliability and predictive utility are required for further development of these signs.

The advent of the Diagnostic and Statistical Manual of Mental Disorders (3rd ed. [DSM-III], American Psychiatric Association, 1980), with its introduction of borderline personality disorder (BPD) as an official diagnostic category, has highlighted the need for empirical validation of psychological test signs of the disorder. In 1977, Singer published what has become an often cited review of the literature on psychological test signs of BPD. At the time of Singer's article, the literature was characterized primarily by "case reports and impressionistic descriptions" (p. 193), which left most claims unsubstantiated by empirical evidence (Widiger, 1982). Approximately 40 empirical studies have been published since 1977 aimed at identifying WAIS, Rorschach, and MMPI characteristics commonly found in BPD test records.

This review considers this body of recent empirical work aimed at identifying test signs that show promise for either their sensitivity to or specificity for BPD. Such a review, it is hoped, will be useful to clinicians in making the diagnosis of
BPD. We provide a critical review of the methodological difficulties this literature contains and thereby focus the attention of future investigators on problems requiring further study.

Both the DSM-III diagnostic criteria and the clinical literature on BPD make clear that borderline patients are individuals who manifest a relatively high level of general psychopathology and are usually characterized as having a multiplicity of symptoms. Both of these trends are reflected in the patterns which emerge from the test data presented in the literature. We argue that a constellation of typical test signs has begun to emerge, which corresponds to the DSM-III diagnostic criteria for the disorder. In data from the WAIS, the Rorschach, and the MMPI, there is evidence of thought disorder, impulsivity, anger and suspiciousness, depression, anxiety, and distorted object relationships, all of which are features relevant to the DSM-III criteria. These test signs typically appear across tests but, for the sake of clarity, we present them separately for each test. Our review is limited to tests in common clinical usage: the WAIS, the Rorschach, and the MMPI. More recently developed tests and structured interviews, such as Millon Clinical Multiaxial Inventory (MCMI; Millon, 1977), Borderline Syndrome Index (BSI; Edell, 1984), Personality Diagnosis Questionnaire (PDQ; Hyler, Rieder, Spitzer, & Williams, 1982), Diagnostic Interview for Borderlines (DIB; Gunderson, Kolb, & Austin, 1981), Personality Disorder Examination (PDE; Loranger, Susman, Oldham, & Rusakoff, 1987), and the Structured Clinical Interview for DSM-III Personality Disorders (SCID-P; Stangl, Pfohl, Zimmerman, Bowers, & Corenthal, 1985) have been extensively reviewed (Dahl, 1985; Widiger & Frances, 1987).

WAIS AND RORSCHACH RESEARCH

Thought Disorder

As stated in the DSM-III, BPD and other severe personality disorders can demonstrate transient psychotic symptoms under stress, a vulnerability that is an ancillary feature rather than as a central diagnostic criterion for the disorder. In contrast, Gunderson and Singer (1975) suggested that vulnerability to transient psychotic experiences might be a central feature of the disorder, at least for a large subset of more disturbed patients. Data from studies of BPD patients' performance on psychological tests seem consistent with Gunderson and Singer's view (one of the most frequently reported findings in the test literature) that BPD test records show signs of moderately severe thought disorder which are comparable to, but less severe than, those found in the test records of schizophrenic patients (Armstrong, Silberg, & Parente, 1986; Blatt & Ritzler, 1974; Bloomgarden, 1980; Carr, Goldstein, Hunt, & Kernberg, 1979; Edell 1987b;

Reports of significant thought disorder on psychological tests predate the BPD diagnosis. In fact, one of the factors that first brought the historic antecedent of the borderline syndrome to the field's attention was Rorschach's (1942) report that he had observed a group of "latent schizophrenic" patients who gave schizophrenic-like Rorschachs despite evidencing no gross psychosis clinically. Rappaport, Gill, and Schaefer (1945, 1946) noted that patients whom they called "preschizophrenic" evidenced little thought disorder on structured tests, such as the WAIS, but did evidence it on unstructured, projective tests like the Rorschach. This constellation contrasted with that of schizophrenic patients who more often produced thought-disordered responses on both structured and unstructured tests. Since the publication of Rappaport et al.'s work, it has become "almost axiomatic" (Singer, 1977, p. 193) for many clinical psychologists that a combination of a thought disorder-free WAIS and a Rorschach with clear instances of thought disorder leads to the diagnosis of BPD.

Despite this, few systematic studies of this hypothesis have been undertaken (Widiger, 1982). Three research groups have found data that are partially consistent with this hypothesis. One research group (Carr et al., 1979; Hymowitz et al., 1983) found that they could successfully differentiate psychotic from borderline patients by the degree of thought disorder on the WAIS, whereas both patient groups studied produced equal amounts of thought disorder on the Rorschach. A second group of investigators (Armstrong et al., 1986) found that adolescents with thought-disordered Rorschachs and intact WAISs manifested symptoms consistent with severe character disorder, whereas those with thought-disordered WAISs and Rorschachs, as a group, manifested a significantly higher percentage of psychotic symptoms. Finally, the third group (Edell, 1987b) found that schizophrenics performed poorer than BPDs on a structured test of cognitive slippage. In comparison with schizotypal, mixed personality disorder and normal controls, BPDs were indistinguishable. However, on the Rorschach, schizophrenics, BPDs, and schizotypal performed an equal amount of thought disorder.

In addition to the studies just cited, there are a number of others which examined performance on either the WAIS or the Rorschach. Some (Buttenheim, Lohr, & Kerber, 1985; Patrick & Wolfe, 1983) have reported that the WAIS records of BPDs are relatively free of thought disorder, but there are now several studies confirming that the Rorschach records of BPDs as well as other severely personality-disordered patients are marked by at least a moderate degree of thought disorder (Blatt & Ritzler, 1974; Bloomgarden, 1980; Exner, 1978, 1986; H. D. Lerner & St. Peter, 1984a, 1984b; Lohr, Saakvitne, & Feinberg, 1985; Patrick & Wolfe, 1983; Singer & Larson, 1981; Wilson, 1985).

Comparing the degree of thought disorder in WAIS and Rorschach protocols may not provide the diagnostician with the greatest predictive power, however.
Hymowitz et al. (1983) found that the presence of thought disorder on the WAIS did not contribute significantly to the discrimination of inpatient BPDs and psychotic patients beyond that available from a simple linear combination of WAIS scores. Psychotic patients were most accurately discriminated from BPD patients by their lower Performance IQ in relation to Verbal IQ, their lower Picture Completion score, and their lower Picture Completion score compared to Vocabulary score. In addition, Armstrong et al. (1986) found that a substantial percentage of the adolescents with both thought-disordered WAIS and Rorschach records were diagnosed as character disordered and not schizophrenic. However, Armstrong (personal communication, February 17, 1987) indicated that many of the clinicians who provided the diagnoses tended to err by assigning milder diagnoses to avoid stigmatizing younger patients.

Few consistent findings relating exclusively to the WAIS can be found in the BPD test literature. The work on intertest and intratest scatter has been equivocal and difficult to interpret (Lohr et al., 1985; Patrick & Wolfe, 1983). Hymowitz et al. (1983) found that BPDs could be discriminated from schizophrenics by their relatively smaller Verbal–Performance IQ discrepancy and by their intact Picture Completion score (see also Crookes, 1984). An overall review of the BPD test literature suggests that further research concerning BPD WAIS records may be fruitful for further exploration.

The idea that BPD patients typically manifest moderately severe levels of thought disorder is also consistent with a more detailed analysis of the findings from Rorschach studies. On the Rorschach, BPD patients often give responses that are odd, illogical, realistically impossible, or bizarre and, therefore, are diagnosed as thought disordered. These include fabulized combinations, in which two contiguous parts of the blot are combined in a fashion that would be impossible in reality (e.g., chickens bouncing basketballs; Rapaport et al., 1945, 1946), and confabulations, where the subject engages in an irrelevant narration and sometimes far-fetched associative elaboration about the percept (Rapaport et al., 1945, 1946).

These moderately severe scores are more frequently found in BPD records in comparison to either normal records (Bloomgarden, 1980; Buttenheim et al., 1985; Singer & Larson, 1981) or published norms (Carr et al., 1979; Exner, 1986; Patrick & Wolfe, 1983). In comparison to neurotic patients, Singer and Larson (1981) found BPDs had more fabulized combinations. Wilson (1985) found confabulations to be more prevalent in BPD than neurotic records, but there was no difference in the number of fabulized combinations. This latter finding was replicated by H. Lerner, Sugaerman, and Barbour (1985) in comparing neurotic records to inpatient BPD records.

In comparison to schizophrenic patients, Singer and Larson (1981) found BPDs as a group produced more fabulized combinations, and that the number of fabulized combinations significantly discriminated between schizophrenic and BPD records. Exner (1986) reported opposite results, finding that schizophrenics
produced more fabulized combinations than BPDs. H. Lerner et al. (1985) reported BPDs to have more confabulations.

In summary, although BPDs have most consistently been shown to produce more moderately severe special scores on the Rorschach than normals and neurotics, the results of comparisons to schizophrenics have been more equivocal.

BPDs can be more reliably discriminated from schizophrenics by their relative paucity of severe special scores (Blatt & Ritzler, 1974; Bloomgarden, 1980; Edell, 1987b; Exner, 1978, 1986; H. Lerner et al., 1985; Patrick & Wolfe, 1983; Singer & Larson, 1981; Wilson, 1985). The contamination response in particular, a response where two ideas fuse into a single idea (e.g., "It looks like a bug and like a lung... It's a bug-lung"), Rapaport et al., 1945, 1946), appears to be almost pathognomonic of schizophrenia (Johnston & Holtman, 1979). Although contaminations are not found in all schizophrenic records, thereby reducing the sensitivity of this score (Edell, 1987b), they are reported as particularly specific to schizophrenia (Exner, 1978). Wilson (1985) reported a multivariate study in which schizophrenic records could be discriminated from BPD records and neurotic records based on the number of contamination responses.

Form quality, an index of the perceptual accuracy of a subject's response, is another feature with some diagnostic utility. Typically, BPD records demonstrate a moderate degree of disturbance in form quality. BPD form quality has been reported as lower than that of normals (Bloomgarden, 1980; Singer & Larson, 1981) and neurotics (Singer & Larson, 1981), as well as lower in comparison to published norms (Exner, 1986). In contrast, BPDs have been found to have higher form quality than schizophrenics (Bloomgarden, 1980; Exner, 1986). Singer and Larson (1981) reported mixed results; they found that BPDs obtained a higher F% than chronic but not acute schizophrenics. Diverse studies have been relatively consistent in their estimates of the average BPD F% or extended F%. Singer and Larson (1981), Patrick and Wolfe (1983), and Buttenheim et al. (1985) found averages of 67%, 69%, and 70%, respectively. Overall, it appears that for BPD patients, responses with adequate form quality generally make up between 65% to 70% of the record, approximately 10% to 15% lower than normals and 10% to 15% higher than schizophrenics.

Conversely, minus form quality (a gross perceptual distortion and weak from quality (unusual or idiosyncratic perceptions) may also discriminate BPD records from those of schizophrenics, normals, and neurotics. The minus form quality response is analogous to the contamination thought-disorder score inasmuch as it represents a qualitatively more severe disturbance. Exner (1978, 1986) reported that schizophrenic records contain more minus responses than do borderline records. This is particularly true for minus responses involving human movement. In these data, there is a general trend for schizophrenics to have more minuses than weaks, whereas for borderlines the trend is in the opposite direction. Poor form responses in BPD records are more likely to be
idiosyncratic rather than grossly distorted. Thus, once again, BPDs appear to be
discriminable from neurotic and psychotic records by their preponderance of
moderate disturbances in thinking.

Impulsivity

One of the diagnostic hallmarks of BPD patients is their propensity for impulsive
behavior. In particular, the DSM-III cites "impulsive self-destructive behavior" as
a diagnostic criterion. Impulsivity is reflected in Exner's (1986) findings. He
reported that BPD records, relative to schizophrenic, schizotypal, and normal
records, are low on two measures of impulse control: the FC:CF+C ratio and
his own D score. The low FC:CF+C ratio indicates that BPD records often
contain a greater number of color responses which do not include a form
determinant or include form only secondarily. This suggests a tendency to
express affect in an unmodulated fashion. The D score is an index of stress
tolerance computed as a difference score reflecting the inner stresses that
impinge on a person (shading, texture, vista, achromatic color, animal, and
inanimate movement determinants) relative to their coping capacities (human
movement and color determinants). Finally, Lohr et al.'s (1985) finding that
BPDs make easy errors on WAIS Comprehension items might hint at a
tendency to behave in socially inappropriate ways or to be ignorant of social
conventions.

Anger and Suspiciousness

"Intense, inappropriate anger" is one of the DSM-III's diagnostic criteria for
BPD. Several investigators have reported that BPD patients give an elevated
number of Rorschach responses with aggressive (Buttenheim et al., 1985;
Callenbach, 1973; Patrick & Wolfe, 1983; Strood, 1978) or malevolent (H. D.
Lerner & St. Peter, 1984a, 1984b) content. However, no data are available on
the discriminative power of these responses. An intriguing finding, reported by
Frieswyk and Colson (1980), is that aggressive responses on the Rorschach were
correlated negatively with initial treatment relationship but positively with
long-term outcome for BPD patients treated at the Menninger Foundation. This
finding suggests that angry and suspicious dispositions in BPD patients may
have prognostic as well as diagnostic implications.

Depression and Anxiety

The DSM-III lists "affective instability" as one criterion for BPD, noting that
BPD patients often shift from a normal mood to depression, irritability, or
anxiety. WAIS and Rorschach data on affective features in BPD test records
have been rather modest. At least one confounding factor has been that BPD
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subjects often were concurrently diagnosed with major depression or another affective illness (Carsky & Bloomgarden, 1981; Lohr et al., 1985). Indeed, Akiskal (1981), among other researchers, argued that there are clear links between BPD and affective disorders. Exner (1986) found BPDs to be higher than schizotypals and schizophrenics on a number of Rorschach test signs of depression and anxiety (e.g., achromatic color and shading). Carsky and Bloomgarden (1981) found that they were able to subtype schizotypal and affective BPDs by the nature of their Rorschach content. In addition, they found that both groups, many of whom also met criteria for a diagnosis of major depression, scored high in Rorschach content (e.g., morbid responses), suggesting an affective disorder.

Even less data have been reported on BPD WAIS performance as it relates to affective features. Lohr et al. (1985) compared normals and patients with major depression to BPDs, many of whom also had major depression. They found that neither BPDs nor depressives showed markedly different subtest profiles than normals, although overall IQ scores were somewhat lower. In addition, both patient groups attempted fewer responses and made more errors on the easy Comprehension subscale items.

Disturbed Object Relations

There is a growing body of research on BPD test signs undertaken by investigators interested in concepts derived from object relations theory. Much of this work involves the use of new scales designed to measure constructs described in the clinical and theoretical literature. For example, Lerner and his colleagues (H. Lerner & P. Lerner, 1982; H. D. Lerner, Sugarman, & Guaghran, 1981; P. Lerner & H. Lerner, 1980) reported that BPD records are more likely than neurotic or psychotic records to contain Rorschach evidence of the primitive defenses described by Kernberg (1975, 1976, 1977). For example, borderlines were more likely to describe human figures in affectively charged language which was extremely positive, extremely negative, or alternated between the two. These primitive defenses are not dissimilar to the DSM-III's diagnostic criterion of "devaluation, idealization and marked shifts in attitude" toward others.

A number of investigators have explored the performance of BPDs on the Blatt Developmental Object Relations Scale (Gibbons, 1984; Hymowitz et al., 1983; H. D. Lerner & St. Peter, 1984a, 1984b; Spear & Lapidus, 1981; Spear & Sugarman, 1984). The Blatt scale measures the developmental qualities of human responses on the underlying dimensions of differentiation, articulation, and integration. A response that would receive a high score would be one in which a full human figure was represented, described in rich detail, and engaged in constructive and reciprocal activity. The most consistent finding is that, overall, BPDs score higher than schizophrenics on the Blatt scale (Hymowitz et al., 1983; H. D. Lerner & St. Peter, 1984a, 1984b; Spear & Lapidus, 1981; Spear
& Sugarman, 1984), though not every study finds significant differences on every subscale. H. D. Lerner and St. Peter (1984a, 1984b) found that inpatient BPDs differed from schizophrenics, neurotics, and outpatient borderlines in the number of poor form responses which received a high developmental score on the Blatt scale. This finding suggests that inpatient BPDs fall somewhere on a continuum between neurotics who produced good form/high developmental quality responses and psychotics who produced poor form/low developmental quality responses. Finally, there have been unsuccessful attempts to use the Blatt scale to differentiate BPDs from other personality disorders (Gibbons, 1984) and to subtype BPD into obsessive and hysterical subtypes (Spear & Lapidus, 1981; Spear & Sugarman, 1984).

Research projects using these scales represent some of the challenges and difficulties intrinsic to attempts to operationalize psychoanalytic theory in a research context. The scales are often abstract and complex, reliability is sometimes only barely acceptable, and validity is largely unestablished. Practically speaking, the elaborate scoring procedures required by these scales may be too labor intensive for the average clinician to justify their use. Nonetheless, as the literature grows in this area, scales such as these may prove their empirical value.

Other Findings

One miscellaneous finding is worthy of mention. Exner (1978, 1986) found that BPDs score higher than schizophrenics, schizotypals, and normals on his Egocentricity Index (3r + (2r)/R), which certainly fits the BPD character style.

MMPI RESEARCH

The MMPI profiles of BPDs, like their WAIS and Rorschach records, typically reveal test signs of thought disorder, impulsivity, depression, anxiety and anger, and suspiciousness.

Thought Disorder

The items of the MMPI Schizophrenia (Sc) scale reflect, in part, unusual thought processes and peculiarities of perception. Consequently, the items on this scale come closest to the concept of thought disorder as derived from Rorschach and WAIS protocols. Virtually every MMPI study of BPDs has reported T-scores greater than 70 on the Sc scale (Abramowitz, Carroll, & Schaffer, 1984; Archer, Bali, & Hunter, 1985; Edell, 1987a; Evans, Ruff, Braff, & Ainsworth, 1984; Gustin et al., 1983; Hurt, Clarkin, Frances, Abrams, & Hunt 1985; Kroll et al., 1981; Kroll, Carey, Sines, & Roth, 1982; Lloyd, Overall, & Click, 1983; Lloyd,
Overall, Kimsey, & Click, 1983; Patrick, 1984; Resnick et al., 1983; Snyder, Pitts, Goodpaster, Sajadi, & Gustin, 1982). Typically, the Sc scale is the most elevated scale in the BPD record (Abramowitz et al., 1984; Archer et al., 1985; Evans et al., 1984; Gustin et al., 1983; Hurt et al., 1985; Kroll et al., 1981; Kroll et al., 1982; Patrick, 1984; Resnick et al., 1983; Snyder et al., 1982). BPDs have been found to score higher on the Sc scale than normals (Edell, 1987a; Lloyd, Overall, & Click, 1983), patients with other personality disorders (Archer et al., 1985; Gustin et al., 1983; Lloyd, Overall, Kimsey, & Click, 1983; Resnick et al., 1983), dysthymic disorders (Archer et al., 1985; Snyder et al., 1982), conduct disorders (Archer et al., 1985), mixed inpatient populations (Archer et al., 1985; Hurt et al., 1985, Kroll et al., 1981; Kroll et al., 1982), and mixed outpatient populations (Hurt et al., 1985; Lloyd, Overall, Kimsey, & Click, 1983). However, BPDs' scores on the Sc, Pa, and F scales have been found to be indistinguishable from those of schizophrenics (Evans et al., 1984). Edell (1987a) found schizotypal personality disorders scored higher than BPDs on the Sc scale.

To be consistent with the Rorschach data, which suggests qualitative differences in thought-disorder indices between BPDs and schizophrenics, one would expect to see some indication of a parallel difference in the qualitative severity of the MMPI items endorsed. For example, one would expect BPDs to be more likely to endorse statements from the Sc scale describing experiences of derealization, but not first rank symptoms such as auditory hallucinations. To date, no test of this hypothesis has been reported.

Impulsivity

One of the typical symptoms of BPD patients is their propensity for impulsive behavior, and the Psychopathic Deviate (Pd) scale taps characterological features such as impulsivity and low frustration tolerance. As with the Sc scale, significantly elevated Pd scale scores are almost universally reported (Archer et al., 1985; Edell, 1987a; Evans et al., 1984; Gustin et al., 1983; Hurt et al., 1985; Kroll et al., 1981; Kroll et al., 1982; Lloyd, Overall, & Click, 1983; Lloyd, Overall, Kimsey, & Click, 1983; Patrick, 1984; Resnick et al., 1983). Next to the Sc scale, BPDs tend to produce their second highest elevation on the Pd scale (Kroll et al., 1981; Kroll et al., 1982; Lloyd, Overall, & Click, 1983; Lloyd, Overall, Kimsey, & Click, 1983; Patrick, 1984; Resnick et al., 1983). BPD groups have been found to score significantly higher on the Pd scale than chronic and acute schizophrenics (Edell, 1987a; Evans et al., 1984), dysthyms (Snyder et al., 1982), other personality disorders (Gustin et al., 1983), nonborderline inpatients (Kroll et al., 1981; Kroll et al., 1982), nonborderline outpatients (Lloyd, Overall, Kimsey, & Click, 1983), and normals (Edell, 1987a; Lloyd, Overall, & Click, 1983). In no study has any group been found to score higher on the Pd scale than BPDs.
Depression

Typically, the third highest scale in the BPD MMPI profile is the Depression scale (D) (Evans et al., 1984; Hurt et al., 1985; Kroll et al., 1981; Kroll et al., 1982; Patrick, 1984; Resnick et al., 1983), reflecting an atmosphere of apathy, diminished self-worth, and dissatisfaction, feelings not directly related to the DSM-III criteria for BPD but perhaps related to such criteria as chronic feelings of emptiness or boredom and identity disturbance. The majority of the MMPI studies report elevations in BPD profiles on the D scale (Abramowitz et al., 1984; Archer et al., 1985; Edell, 1987; Evans et al., 1984; Gustin et al., 1983; Hutt et al., 1985; Kroll et al., 1981; Kroll et al., 1982; Lloyd, Overall, & Click, 1983; Lloyd, Overall, Kimsey, & Click, 1983; Patrick, 1984; Resnick et al., 1983). BPDs have been found to score higher than mixed psychiatric inpatients (Kroll et al., 1981), mixed adolescent inpatients (Archer et al., 1985), mixed psychiatric inpatients and outpatients (Abramowitz et al., 1984), chronic schizophrenics (Evans et al., 1984), and normals (Lloyd, 1987; Lloyd, Overall, Kimsey, & Click, 1983). Schizotypals have been found to score higher than BPDs (Edell, 1987).

Anxiety

The Psychasthenia scale (Pt) is sensitive to feelings of anxiety, dread, and general moodiness and has been reported as significantly elevated in BPD records by several investigators (Abramowitz et al., 1984; Edell, 1987; Evans et al., 1984; Gustin et al., 1983; Hutt et al., 1985; Kroll et al., 1981; Kroll et al., 1982; Lloyd, Overall, & Click, 1983; Lloyd, Overall, Kimsey, & Click, 1983; Patrick, 1984; Resnick et al., 1983). BPDs have been found to score higher than mixed inpatients and outpatients (Hurt et al., 1985; Kroll et al., 1982), adolescent conduct disorder and dysthymic patients (Archer et al., 1985), and normals (Edell, 1987; Lloyd, Overall, Kimsey, & Click, 1983). Schizotypals have been found to score higher than BPDs (Edell, 1987).

Anger and Suspiciousness

The Paranoia (Pa) scale is also typically elevated above normal limits in BPD groups (Archer et al., 1985; Edell, 1987; Evans et al., 1984; Gustin et al., 1983; Hurt et al., 1985; Kroll et al., 1981; Kroll et al., 1982; Lloyd, Overall, & Click, 1983; Lloyd, Overall, Kimsey, & Click, 1983; Patrick, 1984; Resnick et al., 1983) and is probably most closely related to the DSM-III criterion of intense, inappropriate anger, or lack of control of anger. BPDs were found to score higher on the Pa scale than patients with other personality disorders (Gustin et al., 1983; Resnick et al., 1983), dysthymic disorders (Archer et al., 1985; Synder et al., 1982), conduct disorders (Archer et al., 1985), mixed inpatient popula-
3-Point Codes

Some studies also have undertaken examinations of modal profile types. The modal 3-point code in BPD records is Sc-Pd-D (8-4-2) (Evans et al., 1984; Hurt et al., 1985; Kroll et al., 1981; Kroll et al., 1982; Patrick, 1984; Resnick et al., 1983). In a rough sense, averaging across studies, the Pt scale appears to be the fourth highest scale in the typical BPD record (e.g., Patrick, 1984). Nonetheless, it is often the second highest scale in an individual BPD record, typically behind either Sc, D, or Pd. There appears to be some trend for the Pt scale to rank higher in the records of outpatient BPDs (Abramowitz et al., 1984; Lloyd, Overall, & Click, 1983; Lloyd, Overall, Kimsey, & Click, 1983). This would make sense inasmuch as the Pt scale taps neurotic symptoms, and higher functioning patients are more likely to have their principal elevation on this scale.

Nonetheless, although an Sc-Pd-D profile appears to be the modal BPD 3-point code across studies, those studies which report frequency data reveal that the profile represents only a minority of BPD records (Abramowitz et al., 1984; Edell, 1987a; Gustin et al., 1983; Kroll et al., 1981; Patrick, 1984; Widiger, Sanderson, & Warner, 1986). Widiger et al. (1986) found an 8-2-4 code in 41% of their BPD sample, yielding a sensitivity of 57%, a specificity of 85%, and a conditional probability of BPD, given an 8-2-4 profile, of .86. However, when BPDs who also met criteria for antisocial personality disorder were removed from the sample, the 8-2-4 codetype had a much lower hit rate. When casting a broader net, however, it can be said that the majority of BPD records do show the highest peak on the Sc code with either one or more of the D, Pd, Pt, or Pa scales also being elevated (Gustin et al., 1983; Hurt et al., 1985; Patrick, 1984).

Floating Profile

As is apparent from this discussion, regardless of the 3-point code, BPD profiles tend to extreme elevations on a large number of clinical scales. Indeed, the mere number of scales elevated above a T-score of 70 is in itself a finding. Out of 12 studies reporting mean BPD profiles, one found four out of the nine clinical scales above 70 (Patrick, 1984). Three studies found five scales (Archer et al., 1985; Edell, 1987a; Resnick et al., 1983) so elevated. Four studies reported such elevations on six scales (Evans et al., 1984; Hurt et al., 1985; Lloyd, Overall, Kimsey, & Click, 1983), and three studies reported such elevations on seven scales (Kroll et al., 1982; Lloyd, Overall, & Click, 1983; Snyder et al., 1982). Finally, one study reported the mean profile of the BPDs to be elevated above
70T on eight clinical scales (Gustin et al., 1983). Thus, the most typical finding is that, on average, BPD profiles are likely to show elevations above normal limits on six out of nine clinical scales. The masculine-feminine scale (MF) is the only one of the clinical scales that was not normed on a psychiatric population and is probably the least relevant to psychiatric symptomatology and is the only scale on which BPDs have never been found to score above normal limits.

Newmark, Chassin, Gentry, and Evans (1983) described a profile with scores above 70T on all nine clinical scales as a "floating profile." They reported that 30% of the patients who gave floating profiles were BPDs, whereas another 20% were major depressive disorders. However, because Newmark et al. only recorded the primary diagnosis, it is unclear what percentage of major depressive or other diagnoses had concurrent BPD diagnoses.

The Validity Scales

The validity scales of the MMPI may be more sensitive to and specific for a BPD diagnosis than the clinical scales. One of the most reliable findings in the literature is that the average BPD profile has an F scale which is elevated above 70T (Abramowitr et al., 1984; Archer et al., 1985; Edell, 1987a; Evans et al., 1984; Gustin et al., 1983; Hurt et al., 1985; Kroll et al., 1981; Kroll et al., 1982; Lloyd, Overall, & Click, 1983; Lloyd, Overall, Kimsey, & Click, 1983; Patrick, 1984). Originally intended as a measure of deviant test-taking response sets, the F scale is a validity scale composed of statements which cover a broad spectrum of maladjustment and are infrequently endorsed by normals. BPDs were found to score higher on the F scale than patients with other personality disorders (Archer et al., 1985; Gustin et al., 1983; Resnuck et al., 1983), dysthymic disorders (Archer et al., 1985; Snyder et al., 1982), conduct disorders (Archer et al., 1985), mixed inpatient populations (Archer et al., 1985; Hurt et al., 1985; Kroll et al., 1981; Kroll et al., 1982), mixed outpatient populations (Hurt et al., 1985; Lloyd, Overall, & Click, 1983; Lloyd, Overall, Kimsey, & Click, 1983), and normals (Edell, 1987a; Lloyd, Overall, & Click, 1983).

The L and K scales, like the F scale, were intended to measure test-taking attitudes. The K scale measures the tendency to minimize pathology, whereas the L scale measures blatant lying or naive efforts to appear normal. BPD patients typically score low (< 50T) on the L and K scales, suggesting a general tendency to emphasize pathology so that these validity scales typically show a strongly inverted V-shape.

Three explanations of these validity scale findings have been proposed. First, the extreme elevations on F may reflect a general "pathology factor" among BPDs who tend to be polysymptomatic. Second, and more specifically, extreme elevations on F often reflect the presence of thought disorder. This would be consistent with the Rorschach and MMPI findings just reported which suggest that test signs of thought disorder are common in BPD records. Finally, the high
F, in conjunction with the low L and K, suggests that BPDs report their difficulties in an exaggerated and dramatic fashion, which is congruent with clinical observations.

**Predictor Variables**

In comparison to the Rorschach literature, a larger number of MMPI studies report the results of multivariate analyses aimed at examining the predictive power of MMPI variables (Abramowitz et al., 1984; Archer et al., 1985; Evans et al., 1984; Gustin et al., 1983; Hurt et al., 1985; Lloyd, Overall, Kimsey, & Click, 1983; Snyder et al., 1982). Overall, the MMPI has performed relatively well, with most studies able to correctly classify approximately 75% of the patients. However, no clear pattern emerges across studies as to which clinical scales serve as the most powerful predictor variables.

A surprising finding is that none of the clinical scales were consistently found to account for a substantial amount of the between-group variance when compared to the predictive power of the F scale and the other two validity scales, L and K (Archer et al., 1985; Gustin et al., 1983; Hurt et al., 1985; Snyder et al., 1982). The one exception has been that elevations on the Pa scale have been found quite useful in discriminating BPD from both chronic schizophrenics and acute psychotics (Evans et al., 1984). Although both BPD and psychotic groups were high on the psychoticism scales (e.g., Sc, Pa and F), only the BPDs were high on the Pd scale. Thus, both BPDs and schizophrenics have disturbed thinking, but additional character pathology in the former discriminates them from the psychotic population.

**Other Findings**

Finally, two teams of investigators have initiated what may prove to be valuable efforts aimed at empirically deriving scales or critical items from the MMPI which might differentiate BPDs from other groups (Morey, Waugh, & Blashfield, 1985; Pitts, Gustin, Mitchell, & Snyder, 1985). These attempts are similar to the empirical methods used to develop the original MMPI criterion-group scales. Pitts et al. (1985) found five items that distinguished BPDs from other personality disorders with 80% accuracy, matching the performance of the entire MMPI or, for that matter, any set of test signs, with far more economy. Morey’s group has attempted to identify MMPI items whose content is similar to the DSM-III criteria for each of the 11 Axis II personality disorders (Morey et al., 1985).

**METHODOLOGICAL DIFFICULTIES**

Overall, noticeable progress has been made over the past 10 years in advancing the empirical study of BPD test signs. We have attempted to summarize a
number of consistent patterns. However, there are at least four major methodological problems which need to be addressed in future research.

First, many of the studies, particularly those involving the Rorschach, involve small samples, make no systematic attempt to establish the reliability or validity of the diagnoses assigned, and involve scales that are of questionable reliability and validity. Some of these difficulties reflect inconsistencies within the field with respect to both the diagnosis of BPD and the scoring of psychological tests.

Second, different studies define and diagnose BPD using different methods. Often diagnosis is simply taken from the chart. Ideally, both Axis I and Axis II diagnoses should be established by means of a structured interview (e.g., PDE or SCID) on which the investigators have established reliability. With respect to psychological tests, the use of multiple scoring systems and/or an attempt to focus on the most accepted and well validated scoring systems would be quite helpful.

Third, although many studies report significant differences between BPD and other groups, there is often little indication or attention given to the predictive power of the variables on which the difference was obtained. Consequently, it is difficult to determine the clinical utility of a given test sign. Increased use of multivariate statistical procedures, such as discriminant analysis, would allow investigators to establish the sensitivity and specificity of any given test sign of borderline personality disorder. Investigators willing to undertake such studies should bear in mind that the value of any set of test signs has to be considered in the context of the contrast group. A test sign or, indeed, a pattern of test signs may be quite useful in discriminating BPD records from psychotic records but may be of little use in discriminating these same records from other groups. It is to be expected that the more characteristics that are shared with BPDs by the contrast group, the more insensitive and nonspecific will be discriminations. For that reason, testing may ironically be most accurate at making the same diagnostic discriminations which the clinician has the least difficulty making on his or her own.

Finally, research and clinical observation clearly suggest that BPDs form a heterogeneous population. In some cases, therefore, research results may be specific to the BPD subtype which makes up a given sample. Inpatient BPDs are more disturbed than outpatient BPDs, for example (Gunderson, 1984), and predictably evidence signs of that increased disturbance on psychological tests (H. D. Lerner & St. Peter, 1984; Lloyd, Overall, & Click, 1983). In addition, BPDs often carry concurrent diagnoses. Frequently co-occurring diagnoses may account for some of the variance attributed to BPD. Widiger et al. (1986), for example, found that many of the frequently encountered differences between BPD and other personality disorders dropped out of their data when BPDs who had multiple Axis II diagnoses were removed from their sample. In the future, greater clarity will be required both to partial out the effect of BPD from that of concurrent disorders and to specify which BPD subtype is being studied.
In summary, WAIS, Rorschach, and MMPI test signs of BPD tend to reflect thought disorder, impulsivity, anger, suspiciousness, depression, anxiety, and disturbed object relationships (see Table 1). Limited support has been found for the long-standing contention that BPDs produce intact WAIS records but thought-disordered Rorschachs. Although BPD Rorschachs tend to reflect a moderate level of thought disorder in the form of fabulized combinations and confabulations rather than contaminations and a preponderance of unusual or idiosyncratic form rather than grossly perceptually distorted responses, little evidence for the relatively intact WAIS has been offered. Corresponding to the moderate levels of disturbance on the Rorschach, data gathered on BPD with the MMPI show typical elevations on scales associated with psychoticism, including the Sc, Pa, and F scales.

Indeed, test signs of thought disorder, particularly those of moderate severity, are the most common finding across all psychological tests in BPD records. How

| TABLE 1 |
| Test Signs of Borderline Personality Disorder: A Summary of the Research Literature |
|-------------------|-------------------|-------------------|
| WAIS              | Rorschach         | MMPI              |
| 1. Few instances of thought disorder. | 1. Moderately severe thought disorder scores (e.g., Fabcom) with few severe thought disorder scores (e.g., Contam). | 1. SC-Pa-D (44-60) |
| 2. Relatively intact Picture Completion. | 2. Approximately 69% good form quality. | 2. Pa and Pt > 70. |
| 3. Errors on easy Comprehension items. | 3. Majority of poor form responses are unusual or idiosyncratic rather than gross distortions | 3. F > 70. |
| 4. Variability between BPDs in degree of scatter. | 4. Aggressive and malevolent content. | 4. L and K < 50. |
|                  | 5. Low FC:CF + C ratio. | 5. "Floating profile." |
|                  | 7. High 3r + (2)/R (Exner's egocentricity index). | |
|                  | 8. Human figures described in language that is highly affectively charged. | |
|                  | 9. Human figures that are developmentally advanced but distorted or inaccurate. | |
|                  | 10. Achromatic color, morbid content, shading, and inanimate movement. | |
these findings are understood is certainly open to various interpretations. These findings might alternately be used to suggest that BPD lies along a "schizophrenic spectrum," that BPDs are, as the DSM-III suggests, simply open to transient psychotic episodes under stress or that BPDs manifest qualities of idiosyncratic thinking and experience which really have little to do with psychosis at all (Zannerini, personal communication, January 26, 1987). It is still unclear how sensitive or specific signs of thought disorder are to BPD, especially in relation to other personality disorder groups (Exner, 1986). Moreover, not all BPDs demonstrate disturbances in thinking. Finally, most of the testing research has been conducted with inpatient BPDs who are clearly more prone to evidence higher levels of thought disorder than outpatient BPDs (Gunderson, 1984; H. D. Lerner & St. Peter, 1984; Lloyd, Overall, & Click, 1983).

Aggressive and malevolent content on the Rorschach as well as elevations on the Pa scale of the MMPI are consistent with the symptoms of anger and paranoia reported among BPDs. Impulsivity is reflected in the lowered FC:CF C ratio and Exner's D score on the Rorschach, as well as elevations on the Pd scale of the MMPI. Depression and anxiety are reflected in the elevated number of achromatic color, morbid content, shading, and inanimate movement responses on the Rorschach, as well as elevations on the D and Pt scales of the MMPI. Finally, disturbed object relations are suggested by BPDs unstable, exaggerated, unrealistic, and affectively charged descriptions of human percepts on the Rorschach.

On the MMPI, the modal 3-point code tends to be Sc-Pd-D (8-4-2), with additional elevations on Pa (6) and Pt (7). Although the modal code appears to describe only a minority of the BPD cases, the majority are accounted for by some variation of this pattern typically involving Scales 6 or 7 as the second or third highest elevation. Another way of characterizing BPD profiles is that they tend to be "floating profiles," characterized by a number of scales over 70 T.

Finally, improvements in research methodology are needed to advance our current knowledge. Future researchers are encouraged to employ larger, well diagnosed samples, multiple reliable and valid measures, and multivariate statistics.

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Stephen W. Hurt
21 Bloomingdale Road
White Plains, NY 10605

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