

Criteria for Diagnosing DSM-III Borderline Personality Disorder

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One hundred fifty-nine psychiatric outpatients were examined to determine which of the DSM-III Borderline Personality Disorder (BPD) criteria were most valid in terms of sensitivity, specificity, predictive power positive, and predictive power negative. Combinations of two criteria predicted better than individual ones and combinations of three criteria predicted better still. It is possible that in many instances BPD can be efficiently diagnosed by three criteria. These results were compared to previous findings. The exact criteria that best discriminate depends to a large extent on the comparison groups used. In general it appears the current criteria for BPD are capable of discriminating diverse subject groups. The possibility of searching for "core criteria" that broadly discriminate between differing subject groups is discussed.

KEY WORDS: Borderline personality disorder, diagnostic criteria.

Any psychiatric diagnosis in development requires a period of empirical testing before its criteria are definitively established. Initially a set of prospective criteria is established from the literature, theory, factor analytic studies, or skilled clinicians. These criteria must then be empirically evaluated. The personality disorders are at such a stage of development now. A question then arises as to how to evaluate them. There are many different approaches from many different disciplines. Baldessarini et al. [1] and subsequently Widiger et al. [2] have described a technique taken from psychology for formally proceeding with this process. This technique calculates sensitivity, specificity, predictive power positive (PPP), and predictive power negative (PPN) for proposed criteria and combinations of proposed criteria (with special emphasis on PPP and PPN). Criteria that appear important across multiple studies and populations may be "core criteria." (Core criteria are criteria which are necessary or sufficient factors for the diagnosis of the disorder.) Criteria can vary in their degree of importance in defining a disorder. For example, although transient depression is often associated with many Axis I and Axis II disorders (i.e., high sensitivity, prevalence), it is seldom sufficiently pathognomonic enough to be included in defining criteria. This report presents a set of results from a new population of patients with borderline personality disorders (BPD) using sensitivity, specificity, PPP, and PPN. The discussion places current results in the context of existing findings. The following sections briefly review previous findings. Unless otherwise specified, DSM-III criteria are used. In order to prevent unnecessary repetition of the criteria they will be referred to by one word abbreviation as follows: Impulsivity, Impulsive acts; Interpersonal, Unstable-Intense relationships; Anger, Intense-Uncontrolled anger; Identity, Identity Disturbance; Affective, Affective instability; Alone, Intolerance of being

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Table 1. DSM-III Criteria for Borderline Personality Disorder (BPD)

Impulsivity:	Impulsive acts
Interpersonal:	Unstable–intense relationships
Anger:	Intense–uncontrolled anger
Identity:	Identity disturbance
Affective:	Affective instability
Alone:	Intolerance of being alone
Self-damaging:	Physically self-damaging acts
Boredom:	Feelings of chronic emptiness and boredom

alone; Self-damaging, Physically self-damaging acts; and Boredom, chronic emptiness and boredom. (For easy reference these are shown in Table 1.) In order to make the descriptions of the following studies easier to follow I have summarized the key findings in Table 2.

In a sample of 76 outpatients with a primary Axis II disorder (BPD base rate = 0.34), Widiger et al. found the PPP for the individual DSM III criteria for BPD ranged from 0.56 to 0.73 [2]. They felt that PPP was the measure best reflecting what clinicians are trying to achieve by diagnosis. (PPP indicates how many of those who are given the diagnosis actually have it. Because it is influenced by the prevalence of a disorder a direct comparison of PPP cannot be made across studies.) More interesting, however, was their examination of combinations of two symptoms. Of 28 pairs, 19 had a PPP of greater than 0.80. They identified some especially valuable pairs (Interpersonal–Self-damaging, Self-damaging–Identity, Interpersonal–Identity, Impulsivity–Interpersonal, Impulsivity–Identity, Affective–Boredom) with PPP > 0.90. Widiger et al. concluded that in their population the five symptoms required by DSM-III to make the diagnosis of BPD were not necessary. Their population was particularly sick, as inpatient populations go, so it may not be representative and easily generalizable.

Nurnberg et al. carefully examined 17 BPD-related symptoms on a population of 17 hospitalized BPD patients and 20 controls [3]. Their study basically confirmed the value of DSM-III criteria. However, when their four best criteria [roughly, DSM-III Impulsivity, Interpersonal (Alone and/or Boredom) and “acting out”] were combined into any combination of two symptoms, their PPP was 0.94. They reported no appreciable gain using a combination of three criteria and concluded that five symptoms were not necessary to make a BPD diagnosis in their popu-

lation. Nurnberg et al. [4] also published a further analysis of their data, in which they report their best results for two criteria as Impulsivity–Identity, Impulsivity–Boredom, and Interpersonal–Identity. They also report that when using their five best criteria there was a slight *increase* in the total error rate when five criteria were used as the cutoff rate instead of four. (This is due to an increased false-negative rate.)

McGlashan examined combinations of the BPD criteria with sensitivities greater than 0.50 in their Chestnut Lodge follow-up study [5]. He found that the combination of Anger and Self-damaging was the best predictor for populations that excluded psychotic patients. He found, as did Nurnberg et al., that there was no gain from using more than two criteria. A weakness of this study was that criteria were assessed retrospectively by chart review.

Hurt et al., in a study using advanced statistical methods not commonly used in this area of research, analyzed four previous studies [6]. They felt that the use of explicit criteria allowed the decision rules for making a diagnosis to be examined and derived statistically. Their analyses indicated that there were three core dimensions to BPD—*Identity disturbance*, *affective disturbance* and *impulse disturbance*. (They feel the latter two would be especially effective for identifying BPD.) They conclude that a rule requiring three of the following four criteria would be close to optimum—Impulsivity, Interpersonal, Affective, and Identity. Limitations of the Hurt report are its particularly ill populations, many of whom were diagnosed by chart review, and also the fact that the report included some of the studies reported above, allowing the danger of circularity.

The current study reports on a new population of psychiatric outpatients. The present contribution differs from previous studies in that it reports on general psychiatric outpatients. The current results will be integrated with previous findings.

METHODS

Population

Two proband populations were used for the present study. The first was a group of panic disorder patients recruited to take part in a treatment trial ($N = 80$) by advertising. Axis I disorders in this group were diagnosed by the Structured Clinical Interview for DSM-III Disorders [7] administered by a board-

Table 2. Summary of Key Points of the DSM-III Borderline Personality Disorder Criteria Study

Study	Sample Size	Number BPD	Description Sample	Description Comparison Group	Method of Assessment	Best Criteria Reported
Current study (Reich)	159	32 (20%)	Nonpsychotic randomly selected psychiatric outpatients with BPD, 74.3% female 30.9 ± 7.7 years	Same except no diagnosis of BPD 63% female 33.8 ± 10.2 years	(self-report) DSM-III Axis II	Single Criteria: Alone-Self-damaging-Identity Two Criteria: Impulsivity-Affective Impulsivity-Self-damaging Impulsivity-Boredom Anger-Identity Identity-Alone Identity-Self-damaging Three Criteria: virtually all were good
McGlashan [5]	160	50 (31%)	Patients who had been hospitalized at Chestnut Lodge who were nonpsychotic and who had BPD diagnosis	Same, except did not meet BPD diagnosis	Chart review using standardized methods	Anger + Self-damaging
Widiger et al. [2]	76	26 (34%)	Psychiatric inpatients at a state hospital selected for presence of an Axis II disorder who had BPD	Same, except did not meet BPD diagnosis	Semistructured interview given by lay interviewers	Individual criteria: PPP ranged from 0.56 to 0.73 Combinations of two criteria with PPP > 0.90 Interpersonal-Self-damaging Identity-Self-damaging Interpersonal-Identity Impulsivity-Interpersonal Impulsivity-Identity Affective-Boredom
Nurnberg et al. [3, 4]	BPD = 17 Controls = 20		Hospitalized BPD patients selected from consecutive admissions to an acute inpatient ward. These patients were nonpsychotic and did not have a major affective disorder, a predominant drug or alcohol problem, or an organic brain syndrome.	Members of psychiatric institution staff	DIB ≥ 7	Any combination of Impulsivity, Interpersonal (Alone and/or Boredom) and "acting out." Also good predictors in combinations of two: Identity-Impulsivity Identity-Interpersonal

certified psychiatrist. All patients were required to meet criteria for panic disorder and to be having at least one panic disorder per week. Patients were excluded if they were schizophrenic, mentally retarded, had an organic brain syndrome, mania, obsessive-compulsive disorder, drug or alcohol abuse

in the last year, or major depression that dominated or preceded their panic disorder symptoms. The second group was a sample of randomly selected psychiatric outpatients drawn from new intakes to the psychiatry outpatient clinic ($N = 79$). Patients with psychotic symptoms, an organic brain syndrome, or

mental retardation were excluded. Here the patients' Axis I diagnoses were determined for this group by a masters' level interviewer using the Schedule for Affective Disorder and Schizophrenia Lifetime Version (SADS-L), which uses Research Diagnostic Criteria (RDC).

Although different procedures were used to diagnose the different populations, in both groups most diagnoses had been excluded except for the anxiety and depressive disorders. DSM-III and RDC criteria do have some differences in these diagnoses, but they are not major and are not the focus of this study.

Personality Measures

Personality disorders in probands were determined by the Personality Diagnostic Questionnaire (PDQ) [8]. The PDQ is a 152-item, self-administered, true-false instrument measuring all 11 DSM-III, Axis II personality disorders. Test-retest reliability for psychiatric outpatients at 1 month is 0.56 or above for paranoid, schizotypal, antisocial, BPD, avoidant, and compulsive disorders [9]. (The specific kappa for BPD is 0.63.) Our own work with the PDQ for 8-week test-retest gave a kappa for BPD of 0.50 [10]. A comparison of the PDQ with two DSM-III Axis II interview instruments [Personality Disorder Examination (PDE), version 1 and Structured Clinical Interview for DSM-III, Axis II (SCID II)] indicated that, in general, the PDQ agreed with the interview instruments as well as they agreed with each other. In that study when the PDQ was compared to an all data personality "L.E.A.D. standard" BPD had a PPP of 0.63 and an PPN of 0.88. These are acceptable values given the state of the art of DSM-III personality measurement [11].

PROCEDURES

Panic disorder patients were given the PDQ during their baseline week, 1 week after they had been tapered off all medication. The intakes to the psychiatric outpatient clinic were given the PDQ upon intake. Both groups were instructed to fill out the form "as they usually were" rather than as they were when they were acutely ill. Although the acute illness state has been shown to affect personality measures [12, 13] and since adequate PDQ test-retest reliability when going from the acutely ill to fully treated state has been achieved by our research

group, we felt we could use these measures. A difficult comparison of BPD outpatients to the remainder of the outpatient population was performed (rather than comparing BPD to normals). All patients signed and understood informed consent forms.

ANALYSIS

First, PPP, PPN, sensitivity, and specificity were calculated for all eight individual criteria. Then PPP and PPN were reported for all combinations of two criteria, and then for all possible combinations of these three criteria. In order to have a more convenient method of comparing results, a "summary score" was calculated. It consisted of the sum of sensitivity, specificity, PPP, and PPN multiplied by 100 and divided by 4. This is a rough measure and is affected by base rate, but it provides an easy and quick way to compare results within a given study. In general, the closer the value is to 1 the more useful the criteria (or set of criteria): the closer to 0, the less useful the criteria.

RESULTS

There were 159 patients in the sample, of whom 10 (63%) were female. The mean age (\pm SD) was 33 ± 10.2 years. Thirty-two (20%) met PDQ criteria for BPD. Those with BPD tended to be slightly younger (30.9 ± 7.7 years) and some tendency to be more frequently female (74.3%). Of those with BPD the following other personality disorders (PDs) were present: paranoid 2, schizoid 1, schizotypal 19, histrionic 16, narcissistic 1, antisocial 4, avoidant 10, dependent 20, and compulsive 16. [It should be noted that the PDQ tends to overdiagnose schizotypal PD (Hyler, personal communication).] On Axis I, for those for whom the data were available, 28 (19.0%) had a lifetime history of major depressive disorder, 80 (54.4%) had a lifetime history of panic disorder, and 2 (1.4%) a lifetime history of bipolar disorder. A somewhat higher percentage of BPD than non-BPD patients had a lifetime history of alcohol abuse [6 (18.8%) vs 4 (3.6%)] and drug abuse [6 (18.8%) vs 5 (4.5%)].

The sensitivities, specificities, PPP, PPN, and summary scores for the eight DSM-III BPD criterion are shown in Table 3. Similar analysis for pairs of these criterion are shown in Table 4 and the same analyses

Table 3. Sensitivity, Specificity, Predictive Power Positive, and Predictive Power Negative for DSM-III BPD Criteria^a

Criteria	Sensitivity (×100)	Specificity (×100)	PPP (×100)	PPN (×100)	Summary ^b
Impulsivity	87.5	77.2	49.1	96.1	77.5
Interpersonal	90.6	59.1	35.8	96.2	70.5
Anger	59.4	77.2	40.0	88.3	66.2
Identity	87.5	78.7	50.9	96.2	78.3
Affective	96.9	52.8	34.1	98.5	70.6
Alone	56.3	85.8	50.0	88.6	70.2
Self-damaging	34.4	93.7	57.9	85.0	67.8
Boredom	87.5	73.2	45.2	95.9	75.5

^a N = 159. Frequency of borderline BPD—0.20.

^b Summary = $\frac{\text{Sensitivity} + \text{Specificity} + \text{PPP} + \text{PPN}}{4} \times 100$.

Table 4. Sensitivity, Specificity, Predictive Power Positive, and Predictive Power Negative for Combinations of two BPD Criteria^a

Combination of Criteria	Sensitivity (×100)	Specificity (×100)	PPP (×100)	PPN (×100)	Summary ^b
Impulsivity, Interpersonal	100	78.1	58.1	100	84.1
Impulsivity, Anger	89.5	92.6	73.9	97.4	88.4
Impulsivity, Identity	96.2	87.4	67.6	98.8	87.5
Impulsivity, Affective	100	75.0	58.7	100	83.4
Impulsivity, Alone	100	97.6	87.5	96.3	—
Impulsivity, Self-damaging	81.8	98.9	90.0	97.9	92.2
Impulsivity, Boredom	100	91.0	77.4	100	92.1
Interpersonal, Anger	100	81.1	53.3	100	83.6
Interpersonal, Identity	100	77.9	56.8	100	83.7
Interpersonal, Affective	100	59.0	45.2	100	76.1
Interpersonal, Alone	89.5	92.5	77.3	96.9	89.1
Interpersonal, Self-damaging	83.3	93.5	66.7	97.3	85.2
Interpersonal, Boredom	100	74.7	54.4	100	82.3
Anger, Identity	89.5	96.1	85.0	97.4	92.0
Anger, Affective	95.0	75.7	51.4	98.3	80.1
Anger, Alone	66.7	95.5	71.4	94.4	82.0
Anger, Self-damaging	41.7	97.9	71.4	92.9	76.0
Anger, Boredom	89.5	89.0	65.4	97.3	85.3
Identity, Affective	100	77.8	62.8	100	85.2
Identity, Alone	93.8	96.6	83.3	98.8	93.1
Identity, Self-damaging	81.8	98.9	90.0	97.9	92.2
Identity, Boredom	100	87.5	68.6	100	89.0
Affective, Alone	100	88.9	70.8	100	89.9
Affective, Self-damaging	91.7	94.0	73.3	98.4	89.4
Affective, Boredom	100	71.4	55.1	100	81.6
Alone, Self-damaging	38.5	100	100	92.6	82.8
Alone, Boredom	81.8	94.1	78.3	95.2	87.8
Self-damaging, Boredom	88.9	95.7	66.7	98.9	87.6

^a N = 159. Frequency of BPD—0.20.

^b Summary = $\frac{\text{Sensitivity} + \text{Specificity} + \text{PPP} + \text{PPN}}{4} \times 100$.

for combinations of three criteria are shown in Table 5.

As expected, the individual criteria show significant association with the diagnosis of BPD. However, only three of the criteria (Alone, Self-damaging, and Identity) show a PPP greater than or equal to 0.50. Impulsivity, Identity, and Boredom give the best summary scores. The combinations of two sets of criteria show better results, with PPP > 0.50 in 27 of 28 pairs and 14 of 28 over 0.70. Six combinations have summary scores above 90.

Table 4 indicates that virtually all the combinations of three criteria tried have excellent PPP and PPN in our population. Five combinations have a maximum summary score of 100.

DISCUSSION

The findings of this study (discussed in more detail below) are somewhat different from previous findings. Variables influencing this difference include the population studied (generally *less* ill functioning outpatients rather than inpatients), the data collection method (self-report versus interview personality measurement instruments), base rate differences, the nature of the control group, the specific personality instruments used, the type of interviewer, and current assessment versus chart review. However, we believe that the differing patient population is the greatest source of differences in our findings.

Our sample could be criticized for pooling two outpatient samples, because the nature of the sample can affect the outcome. That criticism would not be valid here for several reasons. First, the samples were well described, so that investigators know its composition. Second, when run individually the results did not differ from the pooled group. Third, this type of sample (randomly selected nonpsychotic ambulatory psychiatric outpatients) has never been reported on previously in this type of analysis, so that this study is of value as a pilot report.

At present there is some discussion in the literature as to whether self-report instruments can be as reliable as interview measures [14]. Although their position should be kept in mind, there is no theoretical reason why a self-report instrument could not be appropriate for some criteria and disorders. The PDQ test-retest values are as good as can be expected given the level of development of the field. In addition, the PDQ has now been used in a number

of studies where it gives results consistent with prior studies [15–20]. (The PDQ also often gave results similar to other personality measures in some of those studies.) We feel our report provides valuable data on an essentially previously unreported population.

An examination of our findings shows overlap with previous findings, but not identity. In terms of a single criterion, the best symptoms of Widiger et al. [2] appear to be Interpersonal, Anger, and Boredom whereas for Nurnberg et al. [5] they appear to be Impulsivity, Interpersonal, Identity, Boredom, and “acting out.” The best single criteria from this report were Impulsivity, Interpersonal, Identity, Affective, Alone, and Boredom. An interesting minor finding of our study is that the criterion Boredom had been felt to be of little value and was replaced in DSM-III-R with a fear of abandonment. Our findings and those of others indicate that the original criteria may have been of value.

In general it appears that a combination of two BPD symptoms will often give a fairly good clinical estimate as to the presence or absence of BPD. The specific pairs Widiger et al. [2] found to be especially powerful (Anger–Interpersonal, Anger–Alone, Interpersonal–Identity, Impulsivity–Interpersonal, Impulsivity–Identity, and Affective–Boredom) were also found to be good, but not the best in our sample. Compared with those combinations first predicted by Nurnberg et al. [3] (Impulsivity–Interpersonal, Impulsivity–Alone, Impulsivity–Boredom, Interpersonal–Alone, Interpersonal–Boredom, and Alone–Boredom) we also find several (Impulsivity–Alone, Impulsivity–Boredom, and Interpersonal–Alone) to be better than average predictors. The second set of combinations reported by Nurnberg et al. [3] (Impulsivity–Identity, Impulsivity–Boredom, and Interpersonal–Identity) represent only fair predictors in this study. It is difficult to compare the results found here for combinations of three criteria with those of Nurnberg et al. [4], since it appears that very few combinations of three criteria are really poor predictors.

Impulsivity, Alone, and Boredom appear to be the strongest predictors among these individual criteria. Unlike the first [3] but similar to the second [4] report by Nurnberg et al., we continue to improve our diagnostic accuracy when using combinations of three criteria. Of the four criteria reported by Hurt et al. [6], we only overlap with Boredom. It is possible that an effective diagnosis of BPD could be made with

Table 5. Sensitivity, Specificity, Predictive Power Positive and Predictive Power Negative for Combinations of three BPD Criteria^a

Combination of Criteria	Sensitivity (×100)	Specificity (×100)	PPP (×100)	PPN (×100)	Summary ^b
Impulsivity, Interpersonal, Anger	100	90.9	73.7	100	91.2
Impulsivity, Interpersonal, Identity	68.8	90.9	64.7	92.3	79.2
Impulsivity, Interpersonal, Affective	75.0	87.9	60.0	93.6	79.1
Impulsivity, Interpersonal, Alone	100	100	100	100	100
Impulsivity, Interpersonal, Self-damaging	100	98.4	88.9	100	96.8
Impulsivity, Interpersonal, Boredom	100	91.4	80.8	100	93.1
Impulsivity, Anger, Identity	46.9	98.5	88.2	88.4	80.5
Impulsivity, Anger, Affective	53.1	95.5	73.4	89.4	78.0
Impulsivity, Anger, Alone	100	100	100	100	100
Impulsivity, Anger, Self-damaging	80.0	100	100	98.6	94.7
Impulsivity, Anger, Boredom	100	98.3	93.8	100	98.0
Impulsivity, Identity, Affective	75.0	92.4	70.6	93.9	83.0
Impulsivity, Identity, Alone	37.5	97.7	80.0	86.6	75.5
Impulsivity, Identity, Self-damaging	25.0	99.2	88.9	84.5	74.4
Impulsivity, Affective, Alone	40.6	97.0	76.5	87.1	75.3
Impulsivity, Affective, Self-damaging	28.1	100	100	85.2	78.3
Impulsivity, Affective, Boredom	71.8	93.9	74.2	93.2	84.5
Impulsivity, Identity, Boredom	65.6	95.5	77.8	92.0	82.7
Impulsivity, Alone, Self-damaging	100	100	100	100	100
Impulsivity, Alone Boredom	100	98.3	93.3	100	97.9
Impulsivity, Self-damaging, Boredom	100	100	100	100	100
Interpersonal, Anger, Identity	43.8	98.5	87.5	87.8	79.4
Interpersonal, Anger, Affective	50.0	90.2	55.2	88.2	70.9
Interpersonal, Anger, Alone	100	98.0	90.0	100	97.0
Interpersonal, Anger, Self-damaging	100	100	100	100	100
Interpersonal, Anger, Boredom	100	92.9	77.8	100	92.7
Interpersonal, Identity, Affective	75.0	90.2	64.9	93.7	80.8
Interpersonal, Identity, Alone	43.8	96.2	73.7	87.6	75.3
Interpersonal, Identity, Self-damaging	25.0	99.2	88.9	84.5	74.4
Interpersonal, Identity, Boredom	65.6	92.4	67.7	91.7	79.4
Interpersonal, Affective, Alone	50.0	93.9	66.7	88.6	74.8
Interpersonal, Affective, Self-damaging	31.2	97.0	71.4	85.3	71.3
Interpersonal, Affective, Boredom	75.0	85.6	55.8	93.4	77.5
Interpersonal, Alone, Self-damaging	15.6	100	100	83.0	45.8
Interpersonal, Alone, Boredom	100	96.3	89.5	100	96.5
Interpersonal, Self-damaging, Boredom	100	95.2	70.0	100	91.3
Anger, Identity, Affective	53.1	97.0	81.0	89.5	80.2
Anger, Identity, Alone	15.6	100	100	83.0	74.7
Anger, Identity, Boredom	46.9	98.5	88.2	88.4	80.5
Anger, Affective, Alone	31.3	97.0	71.4	85.3	71.3
Anger, Affective, Self-damaging	15.6	100	100	83.0	74.7
Anger, Affective, Boredom	53.1	93.2	65.4	89.1	75.2
Anger, Alone, Self-damaging	50.0	100	100	97.5	86.9
Anger, Alone, Boredom	83.3	98.4	90.9	96.9	92.4
Anger, Self-damaging, Boredom	100	98.6	80	100	94.7
Identity, Affective, Alone	43.8	97.0	77.8	87.7	76.6
Identity, Affective, Self-damaging	28.1	100	100	85.2	78.3
Identity, Affective, Boredom	71.9	93.2	71.9	93.2	82.6
Identity, Alone, Self-damaging	9.4	100	100	82.0	72.9
Identity, Alone, Boredom	96.9	97.0	79.0	88.3	77.8
Identity, Self-damaging, Boredom	18.8	100	100	83.5	75.6
Affective, Alone, Self-damaging	15.6	100	100	83.0	74.7
Affective, Alone, Boredom	53.1	94.7	70.8	89.3	77.0
Affective, Self-damaging, Boredom	25.0	97.7	72.7	84.3	70.0
Alone, Self-damaging, Boredom	83.3	100	100	98.7	95.5

^a N = 159. Frequency of BPD—0.20. ^b Summary = $\frac{\text{Sensitivity} + \text{Specificity} + \text{PPP} + \text{PPN}}{4} \times 100$.

Table 6. Comparison of Potential Core Dimensions with Empirical Findings^a

Empirical Study	Core dimensions											
	Inappropriate ^b		Abandonment ^c		Identity Disturbance ^d		Affective Disturbance ^e		Impulse Disturbance ^f		Interpersonal ^g	
Widiger	+ ^S	+ ^D	+ ^S	+ ^D	+ ^D		+ ^S	+ ^D	+ ^S	+ ^D	+ ^S	+ ^D
Nurnberg	+ ^S	+ ^D	+ ^S	+ ^D	+ ^S		+ ^S	+ ^D	+ ^S	+ ^D	+ ^S	+ ^D
McGlashan ^h		+ ^D						+ ^D		+ ^D		
Present	+ ^S	+ ^D	+ ^S	+ ^D	+ ^S	+ ^D	+ ^S	+ ^D	+ ^S	+ ^D	+ ^S	+ ^D

^a A core dimension is considered present if either individual or one of a combination of two DSM-III criteria were good predictors for a study. Because PPP varies with prevalence those criteria with the highest PPP within a given study were chosen as best predictors. Natural "break points" were used to separate "good" from "less good" predictors. Single criteria are indicated by a superscript "S" while criteria part of a combination of two are indicated by "D." ^b Criteria Interpersonal, Anger, or Self-damaging. ^c Criteria Interpersonal or Alone. ^d Criteria Identity. ^e Criteria Anger, Affective, Alone, or Boredom. ^f Criteria Impulsivity, Anger, or Self-damaging. ^g Criteria Interpersonal, Identity, Alone. ^h McGlashan only reported his best combination of two pairs, so the data is incomplete.

three of the existing criteria rather than the existing five.

It is important that we try to make sense of the different findings in different studies. In examining the nature of the different studies, the largest differences appear to be between the nature of the subject and control groups (Table 2). The largest difference between subject and control groups was in the studies by Nurnberg et al. [3, 4], where rigidly selected BPD patients virtually without other disorders were compared to psychiatric staff members. It is not surprising that their discriminators were powerful. It appears that for this comparison Impulsivity, Interpersonal, and Alone are excellent predictors. The next most stringent comparison was that of the McGlashan study [5], which compared former nonpsychotic inpatients with and without BPD. Here Anger + Self-damaging appears to separate the groups best. The next level of difficulty appears in the current study between nonpsychotic outpatients with and without BPD. Here Alone, Self-damaging, and Identity appear to work best. Finally, when making comparisons between BPD and other personality disorders in inpatients [2], combinations of Self-damaging, Interpersonal, Identity, and Impulsivity seem to work best. It is clear that the best criteria discriminators rely to a large extent on which groups are being compared.

Another way of examining the differences found in different studies is by using the concept of core dimensions. The concept of core dimensions consists of the idea that specific criteria are either necessary or sufficient to diagnose the disorder. Thus, although two different reports might find different criteria important, they could both be tapping into the same dimension. Hurt et al. [6] approach core

dimensions using a statistical method to generate decision rules. At present, I see these techniques as giving us valuable guidance, but, due to their limitations, not definitive answers. The Hurt et al. study developed the concept of three core dimensions to BPD (*Affect disturbance*, *Identity disturbance*, and *Impulsive disturbance*.) Some of our own work seems to confirm the importance of core dimensions. The best individual criteria in this study seem to be Impulsivity, Alone, and Boredom. However, for our combination of three-criteria analysis, one of the combinations—Interpersonal, Anger, and Self-damaging—has a sensitivity, specificity, PPP, and PPN of 1.00. This result would become more understandable if we postulate that these criteria represent two of the Hurt et al. core criteria that are valuable in diagnosis (*Affect disturbance* and *Impulse disturbance*.) We believe that focusing on core dimensions may well be useful in developing DSM-IV diagnostic criteria.

As a preliminary attempt to examine how core dimensions might work, we have tried to arrange the DSM-III criteria into core dimensions that are suggested by the work of Kernberg, Masterson, Adler, Hurt, and Millon and compare them to available empirical results. Table 6 shows this comparison. In contrast to the criterion comparisons there is broad agreement across studies. Inappropriate aggressiveness, characteristic affective disturbance, and impulse disturbance are positive from all measures in all studies. Fear of abandonment and characteristic interpersonal problems are also in high agreement.

There are of course limitations to this comparison. Some proposed core dimensions are represented by more DSM-III criteria and therefore are more likely to be positive in this analysis. The criteria that fit

the proposed core criteria were drawn in a broad fashion, since, in general, the DSM-III criteria are not tailored to reflect these criteria. Also, it appears that many of these core criteria would overlap. Nonetheless, such broad agreement, when compared to the disagreement when criteria were compared, represents a potential area for new criteria research.

To a fair extent the broad outlines of BPD appear to have been identified. Future research will need to focus on two areas: (1) the best discriminating criteria for specific comparison groups; and (2) the search for broader core criteria that discriminate well across different studies and comparison groups.

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