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THE BORDERLINE PERSONALITY DISORDER CHECKLIST: PSYCHOMETRIC EVALUATION AND FACTORIAL STRUCTURE IN CLINICAL AND NONCLINICAL SAMPLES

The present study examined the assessment and conceptualization of borderline personality disorder with the Borderline Personality Disorder Checklist (BPD Checklist). The BPD Checklist is a DSM-IV based self-report questionnaire, designed to assess the experienced burden of specific BPD symptoms during the previous month. The participants in the study were 140 BPD patients, 55 Cluster C personality disorder patients, 57 patients with only Axis I psychopathology, and 87 nonclinical controls. The psychometric properties of the BPD Checklist and changes during treatment were assessed. First-order confirmatory factor analyses using the BPD Checklist items on seven dimensional BPD models supported both a one-dimensional BPD model and a nine-

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-dimensional one, the latter based on the DSM-IV criteria. Internal consistency as well as construct, concurrent, and discriminant validity proved to be very good. Clinical norms and cutoff scores with high sensitivity and specificity were derived. The questionnaire is suitable as a screening instrument and treatment outcome measure since it proved to be sensitive to change.

Keywords: borderline personality disorder; assessment; psychometrics; factor structure; validity.

INTRODUCTION

Borderline personality disorder (BPD) is a severe psychiatric condition, prevalent throughout health care settings, in which instability in important life-areas (e.g., maintaining relationships, emotional regulation, impulsivity, identity, and cognitive processes; APA, 1994) is the only constant factor. Clinical and research interests in BPD have expanded enormously since the DSM-conceptualization of BPD. More or less parallel to this development is the increased understanding that the nature and complexity of BPD also requires specific screening and assessment instruments for both clinical and research purposes; these are necessary both to understand BPD and to achieve evidence-based BPD treatment practice. Diagnostic interviews (e.g., SCID-II and DIB; First, Gibbon, Spitzer, Williams, & Benjamin, 1997; Zanarini, Gunderson, Frankenburg, & Chauncey, 1989) are often used as outcome measures in BPD (treatment) research (Brown, Newman, Charlesworth, Crits-Cristoph, & Beck, 2004; Clarkin, Levy, Lenzenweger, & Kernberg, 2004; Hoglend, 1993; Nordahl & Nysæter, 2005; Stevenson & Meares, 1992). However, interviews mostly cover long-term periods and are not designed to detect change in shorter time frames; above all, they are very time consuming and thus expensive. A further problem in investigating BPD with most of the widely used (self-report) outcome measures is their focus on relatively general aspects of psychopathology, as a result of which they only reflect a part of the BPD condition (e.g., general symptom levels, anxiety, depression, self-esteem). To sum up, there is a need for instruments that assess the current severity of BPD psychopathology in a restricted time period, are easy to administer, and are sensitive to change so that they can be used to detect effects of treatment.

An important issue in assessing the severity of BPD psychopathology is the conceptualization of BPD – in particular, the decision on whether BPD should be viewed as a one-dimensional or multidimensional construct (Zanarini et al., 1989; Hurt, et al., 1990; Morey, 1991; Adams, Bernat, & Luscher, 2001; Livesley & Schröder, 1991; Clarkin, Hull, & Hurt, 1993; APA, 1994; Arntz, 1999; Fossati

et al., 1999; Sanislow et al., 2002). Previous studies have reported different sub-dimensions of BPD pathology. Zanarini et colleagues (1989) distinguished four dimensions of borderline pathology: affect, cognition, impulsivity, and interpersonal relationships. Hurt et colleagues (1990) identified three sets of BPD criteria: identity, affect, and impulsivity. Morey (1991) and Adams et colleagues (2001) found four dimensions: affective instability, identity problems, negative relationships, and self-damaging behavior. Based on a literature review, Livesley and Schröder (1991) proposed three factors underlying BPD: instability/disorganization, interpersonal exploitation (not a DSM-IV criterion), and self-damaging behavior, as fitting BPD patients best and differentiating them most from other Cluster B personality-disordered patients. In a study on the eight DSM-III-R criteria, Clarkin et colleagues (1993) found evidence for a three-factor structure: uncertainty about self & interpersonal difficulties, affect & affect regulation, and impulsivity. However, there was also some evidence for anger/hostility as an independent fourth factor (separate from affect & affect regulation). Sanislow et colleagues (2002) tested the DSM-IV BPD criteria as a unitary construct but also as a three-factor model comprising disturbed relatedness, behavioral dysregulation, and affective dysregulation. Although some of these models seem to have identical subdimensions (e.g., “affect”), the DSM criteria proposed for these dimensions vary between the models (see the Method section for an overview). In contrast to multidimensional models, factor analytic studies found evidence of good representation of BPD criteria by one factor, with high internal consistency of the scale constituted by the criteria (Arntz, 1999; Arntz et al., 2009, Sanislow et al., 2002). All in all, there is no consensus on whether the DSM BPD criteria should be viewed as representing a unidimensional or multidimensional construct, and in the case of multidimensionality, what the subdimensions are.

We developed two BPD-specific instruments to assess the current severity of BPD pathology: the self-report BPD Checklist, a 47-item questionnaire, and the semi-structured Borderline Personality Disorder Severity Index interview (BPDSI). Both instruments aim to assess the current severity of specific BPD manifestations and were designed for treatment evaluation of BPD patients. More specifically, the BPD Checklist inquires about the patient’s experienced burden of BPD symptoms during the last month, whereas the BPDSI forms a quantitative index of the severity and frequency of BPD-specific behaviors during the last three months. These instruments complement each other, for example in having the self-report versus interview format, the former assessing subjective burden and the latter measuring the frequency of BPD symptoms. This

paper is the first report of the psychometric properties of the BPD Checklist; the BPDSI is described in Arntz, van den Hoorn, Cornelis, Verheul, van den Bosch, and de Bie (2003) and in Giesen-Bloo, Wachtters, Schouten, and Arntz (2010). The BPD Checklist is a 47-item self-report questionnaire, with items based on therapists' clinical observations, the relevant existing BPD literature, and the BPD criteria of the DSM-IV. Items are rated on a 5-point Likert scale, ranging from *not at all* to *extremely*, indicating the extent to which the respondent was troubled by the 47 different BPD complaints during the last month. The BPD Checklist items can be grouped according to the DSM-IV/5 BPD diagnostic criteria. Therefore, one can use the total sum score on the BPD Checklist as an overall index of the subjective burden caused by BPD symptoms, or one can use the separate criterion sum scores.

The aim of the current study was (1) to assess the psychometric properties of the BPD Checklist, (2) to derive its clinical norms, specificity, and sensitivity, (3) to investigate its sensitivity to change, and (4) to examine which is supported better when using the BPD Checklist items in testing seven multidimensional models of BPD: a BPD model with one, higher-order factor or a DSM-based multidimensional BPD model. We examined internal consistency, discriminant, concurrent and construct validity in samples of BPD patients, Cluster C personality disorder patients, patients with only Axis I psychopathology, and nonclinical controls. It was hypothesized that the BPD Checklist would correlate positively with the observed frequency and severity of BPD symptoms (BPDSI-IV; Arntz et al., 2003; Giesen-Bloo et al., 2010), with specific BPD beliefs (PDBQ-BPD section; Arntz, Dietzel, & Dreessen, 1999; Arntz, Dreessen, Schouten & Weertman, 2004), with maladaptive schemas (YSQ; Rijkeboer, van den Bergh, & van den Bout, 2005; Schmidt, Joiner, Young, & Telch, 1995), with self-ideal discrepancy (Self-Goal-Other Discrepancy Scale; Miskimins, Wilson, Braucht, & Berry, 1971), with immature defense mechanisms (DSQ-48; Andrews, Pollock, & Stewart, 1989; Giesen-Bloo, Arntz, Opdenacker, & Spinhoven, 2005), with pathological borderline personality organization features as formulated by Kernberg (IPO; Kernberg & Clarkin, 1995; Lenzenweger, Clarkin, Kernberg, & Foelsch, 2001), and with general psychopathological complaints (SCL-90; Derogatis, Lipman, & Covi, 1973; Arrindell & Ettema, 1986). We expected a significant negative relation between the BPD Checklist and self-esteem (RSES; Rosenberg, 1965) and no substantial correlations with neurotic and mature defenses. With respect to the different control groups, we expected that BPD patients' scores on the BPD Checklist would be significantly higher than either Cluster C PD patients, patients with Axis I pathology, or nonclinical controls.

METHOD

Participants

We concurrently recruited 140 BPD patients, 55 Cluster C PD patients, and 57 patients with only Axis I psychopathology from twelve mental health institutions (inpatient and outpatient). Participation in the study was voluntary and could be stopped at any time. We recruited 87 nonclinical controls through advertisements in local newspapers. Nonclinical controls received gift certificates, proportionally to the amount of time they participated in the study, with an average worth of 30 euro. The comparison samples were not matched on an individual basis to individual BPD patients; instead, we attempted to recruit samples with approximately similar distributions of demographic variables. Sample sizes were based on power considerations (2-tailed $\alpha = .05$; 80% power). Because correlations of the BPD Checklist with other instruments were to be assessed within the BPD group, this sample needed to be relatively large. At least 120 BPD patients are required to detect correlations $>.25$ within the BPD group. With 120 BPD patients, a minimum of 45 clinical controls and 45 nonpatients are required to detect medium effects ($d = 0.50$) between the BPD sample and the other groups at 80% power. Thus, with the actual sample sizes, the attained power was higher. The samples partially overlapped with the samples on which the study of the BPDSI was based (Giesen-Bloo et al., 2010).

After a complete description of the study to all subjects, written informed consent was obtained. Diagnoses were assessed with DSM-IV – based semi-structured interviews (SCID-I and SCID-II; First, Spitzer, Gibbon, & Williams, 1996; First et al., 1997; Groenestijn, Akkerhuis, Kupka, Schneider, & Nolen, 1999; Weertman, Arntz, & Kerkhofs, 2000; Weertman, Arntz, Dreessen, van Velzen, & Vertommen, 2003). All subjects had to be between 18 and 60 years old. General exclusion criteria were psychotic disorders, bipolar disorder, psychiatric disorders secondary to medical conditions, and mental retardation. BPD patients were allowed to have comorbid personality and/or Axis I disorders. Cluster C patients had to meet the criteria for at least one Cluster C PD and were allowed to have comorbid Axis I disorders, but were not allowed to have an additional Cluster A or Cluster B personality diagnosis or to meet more than two BPD criteria. Patients with Axis I psychopathology had to meet the criteria for at least one Axis I disorder and were not allowed to have threshold diagnoses of PD's or to meet more than two BPD criteria. Nonclinical controls had to be free of psychological complaints, could not have any Axis I disorder, PD, or PD threshold di-

agnosis or to meet more than two BPD criteria. The study was approved by the ethical committee of Maastricht University.

Measures

After completing the diagnostic interviews in one or two sessions, the subjects completed the BPD Checklist and a set of instruments administered in another session in order to test the convergent and discriminant validity of the BPD Checklist. The following instruments were administered:

The BPD Checklist (Arntz & Dreesen, 1995). This 47-item self-report questionnaire was developed to assess the subjective burden caused by BPD symptoms during the last month. The items were based on DSM-IV BPD criteria, the literature describing BPD manifestations, and clinical observations. The original Dutch version has been translated into English (see Appendix 1 for the questionnaire), as well as into German, Finnish, Spanish, and Swedish. The Polish translation is published in Appendix 1 to the Polish version of this article.

The Borderline Personality Disorder Severity Index-IV (BPDSI-IV; Giesen-Bloo et al., 2010). The BPDSI-IV is a semi-structured interview based on DMS-IV BPD criteria and yields a quantitative index of the current severity and frequency of specific BPD manifestations. The interview covers a period of three months and is also developed for use as a treatment outcome measure. The BPDSI-IV consists of 70 items, divided among nine criteria in the same order as in the DSM-IV. Each item is rated on an 11-point scale, running from 0 (*never*) to 10 (*daily*). Identity disturbance forms an exception, since it concerns a stable sense of self over a time period rather than a quantifiable symptom. Therefore, identity disturbance items are rated on a scale from 0 (*absent*) to 4 (*dominant, clear and well-defined not knowing who he/she is*); the mean score is then multiplied by 2.5. The total score is the sum of the nine averaged criteria scores (range: 0-90). The index, but also the separate criteria, possess adequate reliability as well as discriminant, concurrent, and construct validity in similar patient groups and nonclinical controls (Arntz et al., 2003; Giesen-Bloo et al., 2010).¹

The Personality Disorder Beliefs Questionnaire – BPD section (PDBQ; Arntz et al., 1999; Arntz et al., 2004). The PDBQ is based on the cognitive theory of PD (Beck, 1990; Arntz et al., 1994). The BPD section includes 20 beliefs, considered to be specific to BPD. The strength of each belief is rated on a 100-mm visual analog scales with *I don't believe this at all* on one end and *I believe this completely* on the other end. The good internal consistency (Cron-

¹ Translation into Polish is in progress.

bach's $\alpha = .95$), criterion validity, and stability of beliefs were demonstrated in Cluster A, B, and C PD-patients, Axis I patients, and nonclinical controls (Arntz et al., 1999; Arntz et al., 2004).

The Young Schema Questionnaire (YSQ; Rijkeboer et al., 2005; Schmidt et al., 1995). The YSQ assesses 16 schemas reflecting Young's extended cognitive theory of PD (Young, 1994). The 205 items are rated on a 6-point Likert scale from *not true at all* to *totally true*. Only a subsample of BPD patients ($n = 81$) filled out this questionnaire. The YSQ proved to be highly sensitive in predicting the presence or absence of psychopathology (Rijkeboer et al., 2005). The internal consistency (Cronbach's alpha) of the YSQ in the current sample was .98.

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The RSES consists of 15 items. Subjects indicate on a 6-point Likert scale from *completely true* to *not true at all* how much they agree with each statement. The scale has been shown to possess good internal consistency (Cronbach's $\alpha = .91$; Giesen-Bloo et al., 2006) as well as construct, convergent, and discriminant validity (Blascovich & Tomaka, 1991; Rosenberg, 1965, 1979).

The Self-Goal-Other Discrepancy Scale (Miskimins et al., 1971). The Scale measures mean self-ideal and self-other discrepancies. It consists of 15 pairs of opposed personality characteristics, which have to be rated on 100-mm visual analog scales from different points of view: how am I? (self), how do other people perceive me? (other), and how do I want to be? (ideal). Only the self-ideal discrepancy measure was administered in this study. The scale has adequate reliability (in the present study, Cronbach's $\alpha = 0.89$) as well as construct and discriminant validity (Miskimins et al., 1971; Berry, Miskimins, & Wilson, 1972; Miskimins & Baker, 1973).

The Defense Style Questionnaire – 48 (DSQ-48; Andrews et al., 1989; Giesen-Bloo et al., 2005b). The DSQ-48 is a psychoanalytically based self-report instrument, measuring how subjects use mature, neurotic, and immature defense mechanisms in daily life. Each of the 48 statements is rated on a 9-point Likert scale from *do not agree at all* to *do agree very much*. The reliability and validity (discriminant, concurrent, and construct) of the immature and neurotic scales are reasonable to good (Cronbach's $\alpha = .80$ and $.70$); the mature scale is less robust (Cronbach's $\alpha = .55$) (Spinhoven et al., 1995; Trijsburg, van 't Spijker, Van, Hesselink, & Duivenvoorden, 2000; Giesen-Bloo et al., 2005).

The Symptom Checklist – 90 (SCL-90; Derogatis et al., 1973; Arrindell & Ettema, 1986). The SCL-90 is a widely used self-report questionnaire, assessing general psychopathological complaints. Subjects rate to what extent they were

bothered by 90 listed complaints during the last week on a 5-point Likert scale from *not at all* to *very much*. The internal consistency of the global scale in the present sample was excellent (Cronbach's $\alpha = .97$). Convergent and discriminant validity were confirmed in an outpatient psychiatric population (Brophy, Norvell, & Kiluk, 1988).

The Inventory of Personality Organization (IPO; Kernberg & Clarkin, 1995; Lenzenweger et al., 2001; Dutch translation: Arntz & Kerkhofs, 1999). The items of the IPO self-report questionnaire, reflecting the borderline personality organizational structure according to Kernberg's theory, were administered to a subsample of BPD patients ($n = 78$). The characterizing 90 items concern identity diffusion, the use of lower level defenses, alterations in reality testing, pathological object relations (narcissistic and poor quality), and superego pathology, and were rated on a 5-point Likert scale from *never true* to *always true*. Reliability and validity have been demonstrated in nonclinical and clinical samples (Lenzenweger et al., 2001; Berghuis, Kamphuis, Boedijn, & Verheul, 2009). The internal consistency of the subscales was good in the present sample, Cronbach's $\alpha > .80$.

TESTED MULTIDIMENSIONAL BPD CONCEPTS

To examine whether a one-factor higher-order BPD concept or a DSM-multidimensional one is supported best, we tested seven multidimensional models of BPD by means of the BPD Checklist's items. The appropriate BPD Checklist/DSM-IV criteria, as we assigned them, are given in parentheses after each model's factors. Because of the development of the DSM over time, not all DSM criteria of the BPD Checklist could be related to a specific factor in every model. Therefore, only items relating to a particular factor of a particular model were used in the analysis, and items of the BPD Checklist criteria not relevant to the model were omitted (see Data Analysis section). The following BPD models with the corresponding factors were included:

Zanarini, Gunderson, Frankenburg, and Chauncey (1989) distinguished four scales measuring borderline pathology in their diagnostic interview for borderline patients (revised): Affect (6, 7, 8), Cognition (9), Impulsivity (4, 5), and Interpersonal Relationships (1, 2).

Hurt, Clarkin, Widiger, Fyer, Sullivan, Stone, and Frances (1990) identified three sets of BPD criteria based on correlations between the DSM-III: Identity (1, 3, 7), Affect (2, 6, 8), and Impulsivity (4, 5).

Morey (1991; Adams, Bernat, and Luscher, 2001) developed a personality assessment inventory in which BPD is conceived as having four dimensions: Affective Instability (6, 8), Identity Problems (3), Negative Relationships (1, 2) and Self-Damaging Behavior (5).

Livesley and Schröder (1991) reviewed the literature and examined which behaviors, of a pool of borderline-related behaviors, fitted BPD patients best and differentiated them most from other Cluster B personality disorder patients. They found three factors underlying BPD, namely their core BPD factor of Instability/Disorganization (1, 2, 3, 6, 7, 9) and the more associated factors of Interpersonal Exploitation (no DSM-IV criteria applicable) and Self-Damaging Behavior (4, 5, 8).

Clarkin, Hull, and Hurt (1993) found evidence for a three-factor structure in BPD in a study on the eight DSM-III-R criteria: Uncertainty About Self & Interpersonal Difficulties (1, 2, 3, 7), Affect & Affect Regulation (5, 6, 8), and Impulsivity (4).

Clarkin, Hull, and Hurt (1993) further discussed the value of Anger/Hostility as an independent fourth factor (Criterion 8, separated from affect & affect regulation Criteria 5 and 6).

Sanislow, Grilo, Morey, Bender, Skodol, Gunderson et al. (2002) tested the DSM-IV BPD criteria as a unitary construct but also as a three-factor model comprising Disturbed Relatedness (2, 3, 7, 9), Behavioral Dysregulation (4, 5), and Affective Dysregulation (1, 6, 8).

DATA ANALYSIS

To examine the dimensional structure of BPD, we performed first-order confirmatory factor analyses with structural equation modeling, with the BPD Checklist items fitted into the seven BPD models, and by calculating the Akaike information criterion (AIC; Akaike, 1987). Since only nested models can be statistically tested against one another, using the AIC is the best alternative. The AIC is a relative measure, used to compare different models that contain the same information. Every model had AICs computed for the proposed three- or four-factor structure, for a one-factor structure, and for a so-called all-factor structure, in which all DSM criteria of the model were considered as separate factors (six, eight, or nine). The lowest AIC among comparable models indicates the most informative model. The three models by Hurt et al. (1990) and both by Clarkin et al. (1993) could be compared directly to each other with chi-square tests, as were the two models by Livesley & Schröder (1991) and Sanislow et al.

(2002). The models by Zanarini et al. (1989) and Morey (1991) could not be compared to other models with chi-square tests.

Internal consistencies of the total and criterion scores were deemed satisfactory if Cronbach's α was above .70 (Nunnally, 1978). Discriminant validity was tested with ANOVA and ANCOVA (with relevant covariates based on group differences; see the Results section), followed up with t -tests of planned comparisons (BPD vs. each of the other groups). Pearson (partial) correlations were calculated for concurrent and construct validity. Clinical norms were derived with formulas of Jacobson and Truax (1991). The sensitivity to change was tested with paired t -tests.

We interpreted all tests with a significance level of 5%. Analyses were performed using the Statistical Package for Social Sciences, version 11.5, and LISREL version 8.30. Due to various missing data, N varies across the analyses.

RESULTS

Group comparability

Demographic data, the number of Axis I diagnoses, and the number of BPD traits in the four groups are summarized in Table 1. Thirty-three Axis I patients had an anxiety disorder as primary diagnosis, 18 patients had a mood disorder, 4 patients had a somatoform disorder, and 1 patient had an eating disorder. Twenty-eight Cluster C PD patients had an obsessive compulsive personality disorder, 24 patients had an avoidant personality disorder, and 3 patients had a dependent personality disorder.

The groups differed significantly with respect to gender, living together with a partner, employment status, age, the number of Axis I disorders, and the number of BPD traits. No significant difference was found for educational level. BPD patients had on average significantly more Axis I diagnoses than Axis I patients. Further between-group analyses were corrected for these variables, except for living together and employment status, which were deemed to be inherent characteristics of the clinical groups (less often having a job, more often disability or welfare compensation; see Miller & Chapman, 2001, for the risks of using covariates that are inherently associated with the independent variable). Analyses on the BPD group were only corrected for the number of Axis I diagnoses, as a regression analysis on the BPD group showed a significant contribution to the BPD Checklist total score only in the case of this variable ($t = 2.16$, $p = .033$, 12.0% of variance explained).

Table 1
Demographic Data, the Number of Axis-I Diagnoses and the Number of BPD Traits on All Groups

	BPD patients (N = 140)		Cluster-C patients (N = 55)		Axis-I patients (N = 57)		Nonclinical controls (N = 87)		Analysis		
	N	%	N	%	N	%	N	%	χ^2	df	p
Women	125	89	30	55	35	61	59	68	32.56	3	<.001
Living together	44	31	27	51	28	53	44	51	13.43	3	<.004
Employment status									61.80	15	<.001
House wife/man	20	14.3	10	18.9	2	3.8	13	15.1			
Student	19	13.6	7	13.2	5	9.4	29	33.7			
Employed	26	18.6	17	32.1	13	24.5	30	34.9			
Disability	58	41.4	18	34.1	26	49.1	6	7.0			
Welfare	16	11.4	1	1.9	6	11.3	5	5.8			
Other	1	0.7	0	0.0	1	1.9	3	3.5			
	M	SD	M	SD	M	SD	M	SD	F	df	p
Age	30.29	7.82	38.19	11.94	34.13	10.28	35.38	14.23	8.31	3	<.001
Education ²	2.55	1.19	2.92	1.24	2.43	1.23	2.72	1.03	2.02	3	.112
Number of Axis-I disorders	2.30	1.48	1.69	1.35	1.59	0.99	0	0	66.09	3	<.001
Number of BPD traits	6.77	1.26	0.98	1.13	0.25	0.55	0	0	1193.28	3	<.001

Note. Chi-square test for gender; ANOVA's for age, education level, employment status, the number of Axis I disorders and the number of BPD traits. ¹Seven cases had missing values. ²In the Netherlands, the educational system has different levels of diplomas, which we ordered in 5 categories ranging from primary school (1) to university (5).

Factorial structure

First-order confirmatory factor analyses using structural equation modeling were performed. The test statistics and AICs of the seven models can be found in Table 2.

Table 2
Models Chi-Square, Values, Degrees of Freedom and Akaike Information Criteria (AIC) of Models Tested in Confirmatory Factor Analyses (SEM)

	Zanarini et al. (1989)			Morey (1991)			Hurt et al. (1990)			Clarkin et al. (1993)			Clarkin et al. (1993)			Livesley & Schröder (1991)			Sanislow et al. (2002)		
all factors / # proposed	4			3			4			3			4			3			3		
	8			6			8			8			8			9			9		
	χ^2	df	AIC	χ^2	df	AIC	χ^2	df	AIC	χ^2	df	AIC	χ^2	df	AIC	χ^2	df	AIC	χ^2	df	AIC
Proposed factor model	2661	696	3227	1589	371	1975	2691	699	3329	2743	699	3468	2646	696	3268	3975	1033	4705	3930	1031	4707
							χ^2	df	AIC				χ^2	df	AIC						
One factor model	3045	702	3703	2038	377	2644	2984			702	3818			4227			1034	5175			
All factor model	2333	675	2719*	1452	362	1751*	2238			675	2612*			3362			999	3789*			

Notes. * The all-factor model is significantly better at $p < .001$ than the proposed factor model and the one-factor model, as revealed by the differences in chi-square values and degrees of freedoms of the nested models. BPDSI-IV/DSM-IV BPD criterion "identity" was not included in Zanarini et al. (1989); "impulsivity," "emptiness," and "dissociation & paranoid ideation" were not included in Morey (1991); "dissociation & paranoid ideation" was not included in Hurt et al. (1990) and Clarkin et al. (1993). Therefore, one-factor model and all-factor model statistics for Hurt et al. (1990) and Clarkin et al. (1993) are identical, and so are those for Livesley & Schröder (1991) and Sanislow et al. (2002).

The all-factor models (meaning models with DSM-IV criteria as factors) explained the BPD Checklist data significantly better, based on the AIC, than the proposed multifactor or one-factor structures (all $p < .001$). This means the AICs indicate that the gain of information obtained with an all-factor model outweighs the gain of using simpler three- or four-factor models. Furthermore, based on the AIC, Clarkin, Yeomans and Kernberg 4-factor model (1993) extracted more information than their 3-factor model (1993) and the one proposed by Hurt et al.

(1990). Sanislow's model (Sanislow et al., 2002) and Livesley and Schröder's model (1991) did equally well. Significance levels for between-row comparisons in Table 2 are not available because statistical tests are not allowed in comparing non-nested models. Given the fact that the model with each DSM criterion as factor was superior, further psychometric analyses focused on this 9-subscale model, in addition to the total-score model.

Internal consistency

The internal consistency of the BPD Checklist proved to be excellent for both the total group and the BPD group (Cronbach's $\alpha = .97$ and $.92$, respectively). Based on the total group, the internal consistency was also calculated for separate cluster scores, or DSM criterion scores, and ranged from satisfactory to excellent: avoids any abandonment $\alpha = .87$, unstable relationships $\alpha = .78$, identity disturbance $\alpha = .89$, self-damaging impulsivity $\alpha = .69$, recurrent (para) suicidal behavior $\alpha = .82$, affective instability $\alpha = .93$, lack of anger control $\alpha = .78$, dissociation and paranoid ideation $\alpha = .86$. No α for chronic feelings of emptiness was calculated since this criterion is assessed through only one item, which correlated very well with the total score ($r_{ii} = .84$). Item-rest correlations (r_{ir}) for the item and for criterion scores related to the total score ranged from $-.01$ to $.90$ (median for items = $.65$, median for criteria = $.84$)². Two items appeared to have a negative item-rest correlation: "gambling" and "shoplifting," both belonging to the self-damaging impulsivity criterion. The removal of these items improved the internal consistency of the self-damaging impulsivity criterion to an acceptable homogeneity level (Cronbach's $\alpha = .72$); the improvement in the internal consistency of the total scale was negligible.

Change during treatment

Thirty-nine BPD patients participated in the uncontrolled pilot study in preparation of a randomized clinical trial (RCT; Giesen-Bloo et al., 2006) in which Schema Therapy (ST) and Transference-Focused Psychotherapy (TFP) were compared. Both are specialist psychotherapies for BPD. ST is an integrative psychotherapy, integrating techniques and insights from CBT, experiential therapies, attachment and other developmental theories into a cognitive model (Young, 1994; Young, Klosko, & Weishaar, 2003). TFP is based on Kernberg's psychody-

² A table with the item-rest correlations of individual, criterion, and total scores can be requested from the author.

namic object relations model of BPD (Clarkin et al., 1999; Yeomans, Clarkin, & Kernberg, 2002). Therapy was open-ended and consisted of individual sessions twice a week. The BPD Checklist was administered three-monthly. With respect to the BPD Checklist, a six-month evaluation for 32 patients showed a significant average decrease of the total score by 14.00 points ($t(31) = 2.64$, $p = .013$, two-tailed, $ES = .52$). After one year of ST or TFP, the total score of 26 patients dropped further by an average 24.27 points compared to baseline ($t(25) = 3.58$, $p = .001$, two-tailed, $ES = .95$).

Eighty-six BPD patients participated in the RCT (Giesen-Bloo et al., 2006). They also demonstrated large reductions in the experienced BPD psychopathology as measured with the BPD Checklist (Giesen-Bloo, Arntz, van Dyck, Spinhoven, & van Tilburg, 2002). Six months after the beginning of ST or TFP, 73 patients reduced their total BPD Checklist score by an average 17.34 points ($t(72) = 6.24$, $p < .001$, two-tailed, $ES = .59$). At one-year of therapy, the total score of 68 patients dropped further by an average 25.22 points compared to baseline ($t(67) = 7.48$, $p < .001$, two-tailed, $ES = .83$). The average BPD reduction of the total score for 54 patients was 29.78 after two years of therapy ($t(53) = 7.81$, $p < .001$, two-tailed, $ES = 1.12$).

Discriminant validity

Table 3 presents BPD Checklist mean total scores, mean DSM criterion scores with standard deviations, and test statistics for all four groups, uncorrected as well as corrected for covariates (age, gender, number of Axis 1 disorders).

BPD Checklist total scores and DSM criterion scores of BPD patients were all significantly higher than those of the control groups. Two items (gambling and shoplifting) did not discriminate between BPD and any control group; the same items were responsible for the limited internal consistency of the “self-damaging impulsivity” criterion. They had very low frequencies in the BPD patients. Scores on three other items did not differentiate between BPD patients and Cluster C patients: the identity item “not daring to recognize the bad sides of yourself” ($p = .057$), the dissociation item “not being able to remember important things (not because of drugs)” ($p = .319$), and the abandonment item “frantically trying to prevent others from leaving you” ($p = .118$), although differences were all in the expected directions.

Table 3
BPD Checklist Mean Total Scores and Mean DSM Criterion Scores of all Groups

Cluster (score range)	Analysis	BPD	CI-C PD	Axis I	NonPts	BPD		BPD ~ Axis I		BPD ~ NonPts	
		Mean (SD) Adj mn (SE)	Mean (SD) Adj mn (SE)	Mean (SD) Adj mn (SE)	Mean (SD) Adj mn (SE)	~ CI-C PD <i>t</i> <i>p</i>	<i>t</i> <i>p</i>	<i>t</i> <i>p</i>	<i>t</i> <i>p</i>		
Abandonment (7-35)	ANOVA	19.44 (6.03)	14.31 (5.39)	11.67 (4.41)	7.33 (0.76)	6.70	<.001	10.29	<.001	18.44	<.001
	ANCOVA	18.94 (0.48)	14.11 (0.68)	11.73 (0.66)	8.60 (0.63)	5.74	<.001	8.77	<.001	11.84	<.001
Relationships (3-15)	ANOVA	8.59 (3.11)	6.04 (2.76)	5.19 (2.32)	3.34 (0.74)	6.42	<.001	8.63	<.001	15.34	<.001
	ANCOVA	8.56 (0.25)	5.95 (0.36)	5.20 (0.35)	3.73 (0.33)	5.85	<.001	7.73	<.001	10.46	<.001
Identity disturbance (8-40)	ANOVA	23.13 (5.79)	17.58 (5.99)	13.74 (5.30)	9.03 (1.47)	6.98	<.001	11.96	<.001	20.66	<.001
	ANCOVA	22.84 (0.50)	17.63 (0.71)	13.84 (0.70)	9.99 (0.66)	5.88	<.001	10.44	<.001	14.02	<.001
Impulsivity (9-45)	ANOVA	15.39 (4.23)	12.04 (3.69)	11.04 (2.82)	9.76 (1.20)	6.26	<.001	8.23	<.001	12.26	<.001
	ANCOVA	15.23 (0.33)	11.93 (0.47)	10.95 (0.47)	10.42 (0.44)	5.57	<.001	7.41	<.001	7.85	<.001
(Para)suicide (3-15)	ANOVA	5.85 (3.03)	3.98 (1.59)	3.39 (1.03)	3.00 (0.00)	5.60	<.001	7.46	<.001	9.95	<.001
	ANCOVA	5.61 (0.21)	4.04 (0.30)	3.38 (0.29)	3.26 (0.28)	4.27	<.001	6.21	<.001	6.16	<.001
Affective instability (4-20)	ANOVA	14.34 (3.76)	10.47 (3.89)	9.07 (3.54)	4.70 (1.27)	7.40	<.001	10.21	<.001	21.50	<.001
	ANCOVA	14.03 (0.31)	10.29 (0.45)	9.12 (0.44)	5.82 (0.42)	6.72	<.001	9.04	<.001	14.24	<.001
Emptiness (1-5)	ANOVA	3.83 (1.11)	3.02 (1.19)	2.30 (1.13)	1.15 (0.72)	5.11	<.001	9.78	<.001	19.72	<.001
	ANCOVA	3.78 (0.10)	2.96 (0.14)	2.30 (0.14)	1.37 (0.13)	4.68	<.001	8.72	<.001	13.31	<.001
Anger-control (4-20)	ANOVA	8.54 (3.28)	6.04 (2.65)	5.23 (2.09)	4.17 (0.72)	6.18	<.001	8.28	<.001	12.56	<.001
	ANCOVA	8.31 (0.25)	5.94 (0.36)	5.26 (0.35)	4.80 (0.33)	5.31	<.001	7.01	<.001	7.58	<.001
Dissociation (8-40)	ANOVA	18.77 (5.85)	14.49 (5.06)	12.65 (4.68)	8.74 (1.69)	5.64	<.001	8.17	<.001	15.43	<.001
	ANCOVA	18.42 (0.48)	14.34 (0.68)	12.59 (0.67)	9.75 (0.64)	4.80	<.001	7.03	<.001	9.85	<.001
Total (47-235)	ANOVA	117.88 (25.61)	87.96 (25.00)	74.26 (22.44)	51.23 (5.62)	8.71	<.001	12.87	<.001	22.64	<.001
	ANCOVA	115.72 (2.10)	87.72 (2.98)	74.36 (2.94)	57.72 (2.78)	7.66	<.001	11.39	<.001	15.02	<.001

Note. CI-C PD—Cluster-C PD; NonPts—Non patients. ANCOVA with age, gender and number of Axis I disorders as covariates. Adj mn = adjusted mean resulting from the ANCOVA (mean corrected for age, gender, and the number of Axis I disorders).

Concurrent and construct validity

Pearson correlations and partial correlations of BPD Checklist total score and other instruments for the total group and the BPD group are presented in Table 4.

The BPD Checklist scores of the total group were strongly related, even after correction, to the other hypothesized variables. The significant positive correlation with neurotic defenses deviated from the expected null correlation. Most correlations dropped slightly after adjustment for age, gender, and the number of Axis I diagnoses, but their discriminative power became more pronounced. The BPD Checklist also showed the hypothesized correlations in the BPD group. Adjustment for the number of Axis I diagnoses led to minimal changes.

Table 4
Pearson Correlations and Partial Correlations of the BPD Checklist Total Score With Other Variables and Test Statistics

	Total group		BPD-patients	
	<i>r</i> with BPD-CL	Corrected <i>r</i> ¹	<i>r</i> with BPD-CL	Corrected <i>r</i> ²
# DSM-IV BPD	.75*** (n = 325)	.65*** (n = 316)	.27** (n = 132)	.22* (n = 130)
BPDSI-IV	.85** (n = 267)	.78*** (n = 263)	.56*** (n = 126)	.51*** (n = 124)
PDBQ – BPD section	.84*** (n = 334)	.76*** (n = 316)	.70*** (n = 140)	.68*** (n = 130)
Self-ideal discrepancy	.62*** (n = 287)	.45*** (n = 280)	.29** (n = 127)	.24** (n = 125)
DSQ-48 – mature defenses	-.09 (n = 276)	-.06 (n = 272)	-.06 (n = 124)	-.04 (n = 122)
DSQ-48 – neurotic defenses	.49*** (n = 276)	.37*** (n = 272)	.30** (n = 124)	.28** (n = 122)
DSQ-48 – immature def.	.72*** (n = 276)	.63*** (n = 272)	.56*** (n = 124)	.54*** (n = 122)
SCL-90	.89*** (n = 292)	.82*** (n = 285)	.81*** (n = 126)	.79*** (n = 124)
Self-esteem	-.75*** (n = 280)	-.64*** (n = 273)	-.58*** (n = 131)	-.57*** (n = 129)
YSQ			.79*** (n = 81)	.79*** (n = 81)
IPO – use lower level defenses			.67*** (n = 78)	.68*** (n = 77)
IPO – identity diffusion			.68*** (n = 78)	.69*** (n = 77)
IPO – alterations reality testing			.54*** (n = 78)	.54*** (n = 77)
IPO – BPO pathological object relations			.58*** (n = 77)	.58*** (n = 77)
IPO – superego pathology			.56*** (n = 78)	.58*** (n = 77)

Note. * $p < .05$; ** $p < .01$; *** $p < .001$ (2-tailed). ¹ Partial *r*, corrected for age, gender, and number of Axis I diagnoses; ² Partial *r*, corrected for number of Axis I diagnoses. Abbreviations: BPD-CL = BPD Checklist, def. = defenses. *N* varies because of missing values.

Clinical norms, sensitivity, and specificity

Clinical norms were derived with formulas of Jacobson and Truax (1991). Considering the BPD group, the dysfunctional cutoff score came to 67.28, indicating that people with a higher score very probably exhibit BPD pathology. The functional cutoff score, based on the nonclinical control group, was 62.47; people with a lower score are probably nonpatients. The reference point between both cutoff scores – between BPD patients and nonpatient controls – is 63.32. Elaborating on the dysfunctional cutoff score, sensitivity was 0.99 (138 out of 140 BPD patients were correctly classified) and specificity was 0.98 (85 out of 87 nonpatients were correctly classified). For the functional cutoff score sensitivity was 1 (140 out of 140) and specificity 0.94 (82 out of 87). The reference point

between the BPD group and the patient groups (Cluster C and Axis I) was 99.23. This means scores above 100 signify BPD-related psychopathology.

In sum, we propose 67 as the clinical cutoff score for recovery from BPD, and 100 as indicative of BPD and as the inclusion criterion for BPD treatment trials.

DISCUSSION

This study examined the BPD Checklist with psychometric methods for suitability as a screening instrument and/or a (treatment) outcome measure; it was also aimed to contribute to an increase in the understanding of the conceptualization of BPD.

The internal consistency of the total and criterion scores was mostly very satisfying. Only the “self-damaging impulsivity” criterion was marginally acceptable. However, removing two of the nine criterion-items, “gambling” and “shoplifting,” improved this internal consistency from $\alpha = .69$ to $\alpha = .72$. Another supporting argument would be that these items were also problematic with respect to the discriminating power between BPD patients and other (non)patients. On the other hand, both items had very low base rates in the BPD group. A possible explanation could be that, although the nature of these behaviors is specific for BPD, their occurrence is of very low frequency: they are often not exhibited in a 1-month period. But this rare occurrence may also indicate that these behaviors are not very common in BPD and therefore not prototypical of BPD symptomatology. Two psychometric studies of the BPDSI (Arntz et al., 2003; Giesen-Bloo et al., 2010) reported similar problems for its items concerning gambling and shoplifting. Based on these repeated findings on gambling and shoplifting, we suggest that these symptoms be left aside in the future DSM conceptualizations of BPD. The lack of discriminant ability between BPD patients and Cluster C PD patients of one abandonment item, one identity item, and one dissociation item cannot be explained by low frequencies in the BPD group. Whether or not to remove these items remains a delicate matter, which needs the balancing of statistics and theory. In our opinion, the removal of these items is, for theoretical reasons, not yet fully warranted. Moreover, the contribution of each item towards the corresponding DSM criterion score or total score was considerable, suggesting that the item did represent the criterion. Further research on the BPD Checklist is needed to clarify whether these items should be kept or removed.

The interpretation of the confirmatory factor analyses of seven different models depend on the application purposes of the BPD model. If one wants to distinguish different classes within the BPD structure, we suggest considering the nine DSM-IV criteria as nine factors, since our results imply that there seems to be no useful reduction of the DSM BPD criteria other than combining them into one BPD score. Compared to an all-factor model (with six, eight, or nine factors), a reduction to three or four factors (clusters of DSM-IV criteria) led to considerable information loss. This observation is not in line with the finding, reported by Sanislow et al. (2002), that the three-factor structure is the best for differentiating and understanding BPD structure, and may be related to the use of a self-report questionnaire versus a structured interview for diagnosing personality disorders. The BPD Checklist tests the DSM-IV BPD criteria on a microscopic level, with several items for each criterion (except for emptiness), whereas a structured interview tests them on a more general level, already filtering and clustering patient information to the (non)presence of a BPD criterion. We found no convincing evidence for a model hypothesizing dimensions between the criterion level and the BPD-as-a-whole level. Thus, although the polythetic DSM model allows a wide variation in BPD criteria combinations – leading to heterogeneity on the criterion level – the concept underlying the criteria appears to be one “overall” dimension. Therefore, these results do support the primary conclusion by Sanislow et al. (2002) about BPD being a statistically unitary construct. Studies by Arntz (1999), Arntz et al. (2009), and Fossati et al. (1999) also concur with this view. Most striking in the current findings is their resemblance to the factor results of a study on the BPDSI-IV (Giesen-Bloo et al., 2010) with a similar design, including the same seven BPD models. The advantage of the so-called all-factor BPD model (based on the DSM) over the proposed or a one-factor model was almost exactly replicated in this study. Only two AIC differences can be noted among the proposed factor models: (1) the 4-factor model by Clarkin et al. (1993) and not the 3-factor model of Hurt et al. (1990) explained the data best in the present study, and (2) the model by Sanislow et al. (2002) was not superior over Livesley and Schröder’s (1991): both explained the data equally well. The differences in the proposed factor models illustrate that creating different factors with different labels does not necessarily provide additional information on or understanding of an individual compared to what an all-factor model provides.

As noted in the Introduction section, the BPD Checklist and the BPDSI are complementary to each other. By now, both instruments have proved to meet the psychometric standards. It will be interesting to examine and compare different ways of determining improvement (or deterioration) in BPD patients during ther-

apy: the therapist's clinical perspective, the patient's self-reported change (the BPD Checklist), and the person's objective change (the BPDSI). If possible, it is therefore desirable to administer the BPD Checklist and the BPDSI at the same assessments. Preliminary results on the BPD Checklist and BPDSI scores in a BPD treatment trial indicate that the observed improvement in frequency of BPD manifestations precedes the experienced improvement in the form of lesser perceived burden (Giesen-Bloo et al., 2002).

CONCLUSIONS

It can be concluded that the BPD Checklist proved to be a psychometrically sound instrument. The BPD Checklist had good to excellent internal consistencies and very good discriminant, convergent, and construct validity. The BPD Checklist proved to be sensitive to change, since the experienced BPD-specific symptoms significantly decreased during psychotherapeutic treatments. First-order confirmatory factor analyses supported both a one- and nine-dimensional model based on the DSM-IV BPD criteria. Clinical norms, specificity, and sensitivity were derived for use in clinical practice and in research. We proposed 67 as the clinical cutoff score for recovery from BPD when the BPD Checklist is used as a treatment outcome measure. To indicate BPD patients, for example in screening/inclusion procedures before BPD treatment trials, a cutoff score of 100 is suggested.

Future research should focus on the functioning of the BPD Checklist as a screening instrument and as a treatment outcome measure. Further studies examining the validity of the BPD Checklist in other clinical control groups (e.g., Cluster B personality disorders, schizophrenia), should also be conducted.

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APPENDIX 1

BPD CHECK LIST
(ENGLISH VERSION)**BPD CHECK LIST**

HOW TO COMPLETE THIS QUESTIONNAIRE?

In this questionnaire you will be asked to what extent you were troubled by certain complaints **during the last month**. Please, indicate for each of the following complaints, to which degree you were bothered, by placing a circle around the answer that applies most to you.

Example:

	Not at all	Slightly	Moderately	To a large degree	Extremely
Headache	1	2	3	4	5

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Translation: Josephine Giesen-Bloo, Maastricht, August 2001

During last month, to what extent were you troubled by:		Not at all	Slightly	Moderately	To a large degree	Extremely
1	Impulsive spending of too much money that you cannot afford to spend	1	2	3	4	5
2	Quick changes of mood	1	2	3	4	5
3	Tantrums	1	2	3	4	5
4	Not feeling oneself anymore, like an outside observer of yourself, or experiencing yourself as in a movie or dream (not because of drugs)	1	2	3	4	5
5	Hitting others or throwing things at others	1	2	3	4	5
6	Injuring yourself on purpose (cutting, pricking, hitting, burning)	1	2	3	4	5
7	Not knowing whether you actually feel attracted to men or women	1	2	3	4	5
8	Gambling	1	2	3	4	5
9	The urge to kill yourself	1	2	3	4	5
10	Uncertainty about who you really are	1	2	3	4	5
11	Feeling bored or empty inside	1	2	3	4	5
12	Drinking too much	1	2	3	4	5
13	Fear that others will leave you	1	2	3	4	5
14	Being so different in various situations or with other people that you don't know who you are anymore	1	2	3	4	5
15	Uncertainty about what your life should look like	1	2	3	4	5
16	Being convinced that others are treating you unfairly	1	2	3	4	5
17	Drug use	1	2	3	4	5
18	Strong changes in feelings for other people	1	2	3	4	5
19	Distrusting other people	1	2	3	4	5
20	Not daring to recognize the bad sides of yourself	1	2	3	4	5

During last month, to what extent were you troubled by:		Not at all	Slightly	Moderately	To a large degree	Extremely
21	The idea that if others really get to know you, they will reject you	1	2	3	4	5
22	Reckless driving (car, motor, bike)	1	2	3	4	5
23	Observing or experiencing the world around you totally differently so that it seems very odd or unreal to you (e.g., others look unfamiliar or like 'robots'; not because of drugs)	1	2	3	4	5
24	The tendency to act in life threatening ways (e.g., in traffic)	1	2	3	4	5
25	Feelings of despair	1	2	3	4	5
26	Trying to kill yourself	1	2	3	4	5
27	Losing your senses because you are convinced/think that somebody who's important to you, will leave you	1	2	3	4	5
28	Threatening other people that you will injure or kill yourself	1	2	3	4	5
29	Binge eating	1	2	3	4	5
30	Finding yourself a bad and unacceptable person	1	2	3	4	5
31	Being convinced that others have it in for you (that you're being persecuted)	1	2	3	4	5
32	Not knowing what friends or loved ones you want to have	1	2	3	4	5
33	Feelings that are unacceptable to you	1	2	3	4	5
34	Not knowing what is actually important to you	1	2	3	4	5
35	Shoplifting	1	2	3	4	5
36	Sudden anxieties, depressions or irritability	1	2	3	4	5
37	Becoming so angry that you lose control and break things	1	2	3	4	5
38	Not being able to remember important things (not because of drugs)	1	2	3	4	5
39	Being very suspicious	1	2	3	4	5
40	Feeling terribly disappointed in someone you first admired or loved	1	2	3	4	5
41	Acting on an impulsive sexual contact you later regretted	1	2	3	4	5
42	Suddenly losing trust in other people	1	2	3	4	5
43	The conviction that you're not able to deal with life on your own	1	2	3	4	5

During last month, to what extent were you troubled by:		Not at all	Slightly	Moderately	To a large degree	Extremely
44	Hating yourself, everybody and the world	1	2	3	4	5
45	Frantically trying to prevent others from leaving you	1	2	3	4	5
46	Uncertainty about what your true standards and values are	1	2	3	4	5
47	Not knowing anymore what you have done or where you are (not because of drugs)	1	2	3	4	5