Available online at www.sciencedirect.com

ScienceDirect

Comprehensive Psychiatry 80 (2018) 97–103

COMPREHENSIVE PSYCHIATRY

www.elsevier.com/locate/comppsych

Clinical utility of the DSM-5 alternative model for borderline personality disorder: Differential diagnostic accuracy of the BFI, SCID-II-PQ, and PID-5

J. Christopher Fowler[a,b,*], Alok Madan[a,b], Jon G. Allen[b], Michelle Patriquin[a,b], Carla Sharp[c], John M. Oldham[b], B. Christopher Frueh[b,d]

[a]*The Menninger Clinic, 12301 Main Street, Houston, TX 77035, United States*
[b]*Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030, United States*
[c]*University of Houston, United States*
[d]*University of Hawaii, 200 West Kawili St., Hilo, HI 96720, United States*

Abstract

Background: With the publication of DSM 5 alternative model for personality disorders it is critical to assess the components of the model against evidence-based models such as the five factor model and the DSM-IV-TR categorical model. This study explored the relative clinical utility of these models in screening for borderline personality disorder (BPD).
Methods: Receiver operator characteristics and diagnostic efficiency statistics were calculated for three personality measures to ascertain the relative diagnostic efficiency of each measure. A total of 1653 adult inpatients at a specialist psychiatric hospital completed SCID-II interviews. Sample 1 (n = 653) completed the SCID-II interviews, SCID-II Questionnaire (SCID-II-PQ) and the Big Five Inventory (BFI), while Sample 2 (n = 1,000) completed the SCID-II interviews, Personality Inventory for DSM5 (PID-5) and the BFI.
Results: BFI measure evidenced moderate accuracy for two composites: High Neuroticism+ low agreeableness composite (AUC = 0.72, SE = 0.01, $p < 0.001$) and High Neuroticism+ Low + Low Conscientiousness (AUC = 0.73, SE = 0.01, $p < 0.0001$). The SCID-II-PQ evidenced moderate-to-excellent accuracy (AUC = 0.86, SE = 0.02, $p < 0.0001$) with a good balance of specificity (SP = 0.80) and sensitivity (SN = 0.78). The PID-5 BPD algorithm (consisting of elevated emotional lability, anxiousness, separation insecurity, hostility, depressivity, impulsivity, and risk taking) evidenced moderate-to-excellent accuracy (AUC = 0.87, SE = 0.01, $p < 0.0001$) with a good balance of specificity (SP = 0.76) and sensitivity (SN = 0.81).
Conclusions: Findings generally support the use of SCID-II-PQ and PID-5 BPD algorithm for screening purposes. Furthermore, findings support the accuracy of the DSM 5 alternative model Criteria B trait constellation for diagnosing BPD. Limitations of the study include the single inpatient setting and use of two discrete samples to assess PID-5 and SCID-II-PQ.

1. Introduction

During the run-up to the DSM 5 Alternative Model for personality [1], empirical reviews and new research focused on the best approach to conceptualizing and measuring personality pathology. Empirically-validated models including the five-factor model (FFM) demonstrated predictive validity in the relation to clinical personality features [2–12]. In light of empirical evidence supporting dimensional models of personality and the superior performance of the FFM, the *Diagnostic and Statistical Manual of Mental Disorders* Personality and Personality Disorders Work Group proposed a hybrid, dimensional model for diagnosing personality disorders consisting of five broad, higher-order personality trait domains comprised of subordinate trait facets of pathological personality [13,14]. The trait facets were integrated into the Criteria B sets for specific diagnoses. In the case of borderline personality disorder (BPD) traits of emotional lability, anxiousness, separation insecurity, hostility, depressivity, impulsivity, and risk taking were proposed as core features of the disorder. In the wake of

* Corresponding author at: The Menninger Clinic, 12301 Main St., Houston, TX 77035, United States.
E-mail address: cfowler@menninger.edu (J.C. Fowler).

https://doi.org/10.1016/j.comppsych.2017.09.003
0010-440X/

the publication of DSM 5, research on the clinical utility of the Personality Inventory for DSM-5 (PID-5) the alternative model's personality trait measure [15] has rapidly built a base of support for its construct validity [16] and clinical utility [17–21] as a broad-based measure of maladaptive personality. A recent study partially supported the proposed BPD trait facets in differentiating BPD from other personality disorders and healthy controls [22]. While informative, the regression models provide limited information about clinical decision making when diagnosing patients. If clinicians are to utilize DSM 5 emerging measures such as the PID-5 to aid in the determination of personality disorder diagnosis then data on trait composites and optimal cutoffs must be established. Of equal importance is establishing the clinical utility of the emerging measures relative to well-validated FFM measures and the traditional DSM-IV measures for PDs. The current study aimed to address this gap by leveraging admission data from the Menninger Outcomes Project [23] to assess the screening accuracy in detecting the presence of BPD among three measures representing three competing approaches to personality assessment: an FFM measure (Big Five Inventory: BFI), self-report DSM 5 polythetic categorical diagnostic criteria (Structured Clinical Interview for DSM-IV Axis II Personality Disorders Questionnaire: SCID-II-PQ) and the dimensional measure of Criteria B personality traits of the alternative model (PID-5). The large voluntary inpatient sample (N = 1653) with a 19% prevalence of BPD provided an excellent test case for evaluating the screening properties of personality measures.

We selected BPD as the disorder to assess because in clinical populations it is the most common personality disorder with a relative risk rate of 28.5% and it has an international lifetime prevalence rate of 5.9% [24]. Longitudinally, BPD is associated with high rates of suicide and severe functional impairment [25–27], comorbid mental disorders [28], treatment utilization [29], and high costs to society [30]. Despite being the most extensively studied personality disorder [31–33] there remains significant gaps in the evaluation of clinically useful screening for BPD.

Measure selection was based on the competing models, and past evidence linking personality facets to BPD. The BFI was utilized due to the strong evidence of convergence between FFM model and personality disorders. In one of the first clinical studies linking the FFM to BPD diagnosis, Clarkin [34] found high neuroticism and low agreeableness were correlated with the categorical diagnosis, and that high neuroticism was correlated with 5 of 9 BPD criteria. Subsequent studies have demonstrated strong association with BPD diagnosis [35] with high neuroticism scores functioning as a distinguishing characteristic of BPD [36]. Reflecting its biological underpinnings, research indicated that the genetic factors that influence individual differences in neuroticism, agreeableness, conscientiousness, and extraversion account for all genetic liability to borderline personality disorder, predominantly through high neuroticism and low agreeableness [37]. Based on these findings FFM traits of high neuroticism and low agreeableness were hypothesized to be associated with BPD diagnosis. Individual FFM traits and an alternative FFM model (high neuroticism, low agreeableness, and low conscientiousness) were also explored.

Borderline items from DSM-IV SCID-II-PQ [38] demonstrated good sensitivity (0.78–0.87) and specificity (Range 0.75–0.78) in predicting BPD [39–42]. Borderline items from the SCID-PQ are expected to provide the best screening properties because the items reflect the SCID-II interview criteria. The PID-5 is a dimensional measure of personality pathology developed by members of the *Diagnostic and Statistical Manual of Mental Disorders* Personality and Personality Disorders Work Group to map on to personality disorders including BPD. According to the alternative model, elevations in traits of emotional lability, anxiousness, separation insecurity, hostility, depressivity, impulsivity, and risk taking are hypothesized to be predictive of BPD. The PID-5 constellation (summed average scores) of the above trait facets will be referred to as the PID-5 BPD algorithm and was hypothesized to produce adequate screening properties for BPD.

2. Methods

2.1. Participants

Sample 1 consisted of 653 adult patients consecutively admitted (November 2010–June 2012) to the Menninger Clinic who completed a SCID II research interview and completed the BFI and self-report SCID-II QP. The SCID-II QP was not used as a screen for the SCID-II interview: Rather, all criteria for 6 PDs (without skip-outs) were assessed using the research version of the Structured Clinical Interview for DSM-IV Axis II Personality Disorders. Based on SCID –II interview 127 (19.4%) patients were diagnosed with BPD. Gender distribution was relatively even with 50.6% female. Average age was 35.9 years (*SD* = 14.6). Participants were Caucasian (90.3%), multiracial (5.8%), African American (1.9%), Asian (1.2%), American Indian (0.4%) and Pacific Islander (0.4%), and 7.3% identified as being of Hispanic or Latino ethnicity. Education level was above the national average with 85.5% indicating some college experience. The majority (62.7%) of participants were not working in the 30 days prior to admission.

Sample 2 consisted of 1000 adult patients consecutively admitted (July 2012–May 2016) to the Menninger Clinic who completed a SCID II research interview as well as the BFI and PID-5 self-report. Based on SCID-II interview 191 (19.1%) patients were diagnosed with BPD. Gender distribution was relatively even with 46% female. Average age was 34.0 years (*SD* = 14.6). Participants were Caucasian (90.2%), multiracial (5.8%), African American (1.9%), Asian (1.2%), American Indian (0.4%) and Pacific Islander (0.6%), and 7.3% identified as being of Hispanic or Latino

ethnicity. Education level was above the national average with 88.7% indicating some college experience. The majority (62.7%) of participants were not working in the 30 days prior to admission.

2.2. Procedures

Data were collected as part of the hospital's ongoing Adult Outcomes Project to assess treatment response. All measures used in the current study were collected within 72 h of admission. Assessments were conducted via hospital-wide web survey on laptop computers. This project was a hybrid clinical quality and research outcomes project, conducted with all patients; accordingly, all assessments were designed and implemented as an element of routine clinical care and integrated into treatment planning and monitoring of progress such that less than 4% of patients declined participation. Patients and their treatment teams were provided with personality profile scores and feedback within 24 h with the expressed intention that individual patient profiles would be used to inform treatment decisions. Patients and teams were informed that the findings would be used to evaluate the overall effectiveness of treatment and for research purposes. Use of the project's data was approved by Baylor College of Medicine's Institutional Review Board.

2.3. Measures

Demographic variables and history of psychiatric hospitalization and psychiatric service usage were assessed using a standardized patient information survey [23]. Personality disorder diagnoses were assessed using the research version of the Structured Clinical Interview for DSM-IV Axis II Personality Disorders [38]. Individual-level criteria were coded as absent (0) or present (1) for Antisocial, Avoidant, Borderline, Narcissistic, Obsessive-Compulsive, and Schizotypal with no skip-outs (other PDs were not coded due to base-rates below 1% in the hospital between 2010 and 2012). Psychiatric disorders were assessed using the research version of the Structured Clinical Interview for DSM-IV Disorders [43]. Master's level researchers conducted all interviews and coded diagnoses after reviewing past psychiatric history, collateral information from family, psychosocial assessment, and nursing assessment. This process combined the ecologically valid longitudinal evaluation of the "all available data" diagnostic approach [44] with the rigorous research diagnostic interviews. In light of the significant overlap between BPD, and mood/anxiety disorders [45–49] interviewers were trained to discriminate between BPD's hallmark of transient/reactive affective lability [45] and the more sustained symptoms of mood disorders. The BFI [50] is a 44-item questionnaire that assesses the FFM personality domains of neuroticism, agreeableness, conscientiousness, extraversion and openness. Domain scales demonstrate high reliability, clear factor structure, and strong convergence with the NEO-FFI [50]. The BFI yielded adequate internal consistency in the current sample for neuroticism (Cronbach's $\alpha = 0.83$), agreeableness (Cronbach's $\alpha = 0.80$), conscientiousness (Cronbach's $\alpha = 0.85$), extraversion (Cronbach's $\alpha = 0.88$) and openness (Cronbach's $\alpha = 0.80$). The BPD items from the SCID-II-PQ [38] consist of 15 Yes/No questions keyed to the 9 BPD criteria such as: "Have you often become frantic when you thought that someone you really cared about was going to leave you?" Psychometric properties of the SCID-II-PQ demonstrated adequate internal consistency (Cronbach's $\alpha = 0.88$) and two week test-retest (ICC = 0.87) reliability [38]. In the current sample, the SCID-II-PQ yielded adequate internal consistency (Cronbach's $\alpha = 0.83$). The PID-5 [15] is 220-item dimensional measure comprised of 25 non-overlapping trait scales that load onto 5 higher-order dimensions (negative affect, detachment, antagonism, disinhibition, and psychoticism). Assessments of the clinical utility of the PID-5 indicated that trait domains accounted for a substantial amount of variance in DSM-IV personality disorder severity and are linked to *DSM-IV* personality disorders [51], and demonstrated incremental validity in predicting DSM-IV PDs [52]. Recent findings indicated that PID-5 traits are highly stable, prospectively predictive of psychosocial functioning, and associated with psychosocial functioning over time [53]. The PID-5 yielded adequate internal consistency in the current sample (Cronbach's $\alpha = 0.98$).

2.4. Data analysis

All analyses were conducted in IBM SPSS version 22.0. Descriptive statistics and independent sample t-tests and chi-square analyses were performed to identify potential differences between Sample 1 and 2. Receiver Operating Characteristics (ROC) analyses were carried out to obtain the area under the curve (AUC) and standard error (SE) using the non-parametric method to assess the accuracy of the screening measures in identifying BPD diagnosis. Diagnostic efficiency statistics [54] were calculated for five metrics of screening properties: 1. Sensitivity (SN: the ability of a "positive" test result to correctly identify treatment non-response); 2. Specificity (SP: the ability of a "negative" test result to correctly identify those individuals without treatment non-response); 3. Positive predictive power (PPP: the probability that an individual has BPD when the test result is "positive"); 4. Negative predictive power (NPP: the probability that an individual does not have BPD when the test result is "negative"); and 5. Odds Ratio (OR: the odds that BPD is predicted when the test result is "positive", compared to the odds of diagnosing BPD when the test result is negative).

3. Results

3.1. Descriptive statistics

There were no significant differences in the samples for age, gender, prevalence of borderline personality disorder

diagnosis, or number for BPD criteria. Sample 1 was diagnosed with more clinical diagnoses (t = 2.40, $p = 0.02$: Cohen's d = 0.12); however, the effect size was small. From the total sample, 82% of patients were diagnosed with at least two co-occurring Axis I disorders with average of 3.5 (*SD* = 2.1). The most prevalent disorders included major mood disorders (MDD Spectrum = 64.3%: Bipolar Spectrum = 18.0%), anxiety spectrum disorders (61.7%), substance use disorders (55.4%), and personality disorders (34.7%). Borderline PD was diagnosed in 19% of the sample.

3.2. Receiver Operator Characteristic (ROC) analyses

Separate ROC analyses were conducted for three BFI composites (t-scores for individual traits, neuroticism + agreeableness [reverse scored], neuroticism + agreeableness [reverse scored] + conscientiousness [reverse scored]), SCIP-PQ, and PID-5 BPD algorithm. Area under the ROC curve indicated poor accuracy of the FFM neuroticism (AUC = 0.69, SE = 0.01, $p < 0.0001$), agreeableness (AUC = 0.67, SE = 0.02, $p < 0.0001$), conscientiousness (AUC = 0.65, SE = 0.02, $p < 0.0001$), extraversion (AUC = 0.45, SE = 0.02, $p < 0.003$) and openness (AUC = 0.50, SE = 0.02, $p < 0.0001$). High neuroticism + low agreeableness composite evidenced moderate accuracy (AUC = 0.72, SE = 0.01, $p < 0.001$). The composite model of high neuroticism + low agreeableness + low conscientiousness evidenced moderate accuracy (AUC = 0.73, SE = 0.01, $p < 0.0001$). The 15-item SCID-II-PQ evidenced moderate-excellent accuracy (AUC = 0.86, SE = 0.02, $p < 0.0001$). The PID-5 BPD algorithm evidenced moderate-excellent accuracy (AUC = 0.87, SE = 0.01, $p < 0.0001$).

3.3. Diagnostic efficiency statistics

The clinical utility of any screening or diagnostic test is its ability to detect or predict any given individual's likelihood of having or acquiring the malady in question [55]. Performance of the FFM algorithms (Table 1) indicated modest sensitivity, specificity and odds ratios. Results indicate scores ≥ 8 on the borderline subscale from the SQID-IIQP was associated with 78% sensitivity, 80% specificity, and odds ratio (OR = 13.67). Similarly, the PID-5 BPD algorithm indicate scores ≥ 11 was associated with 81% sensitivity, 76% specificity, and odds ratio (OR = 13.26).

Table 1
Diagnostic efficiency statistics for personality measures in borderline personality disorder.

BPD screener	SN	SP	PPP	NPP	OR
FFM composites (N = 1000)					
N + A ≥ 112	0.70	0.62	0.31	0.89	3.82
N + A + C ≥ 185	0.71	0.62	0.31	0.90	3.95
SCIDII PQ (n = 653)					
SCIDII PQ ≥ 8	0.78	0.80	0.49	0.94	13.67
PID-5 BPD algorithm (n = 1000)					
PID-5 ≥ 11	0.81	0.76	0.45	0.94	13.27

SP = specificity, the ability of a negative PHQ-9 to correctly identify non-responders; PPP = positive predictive power; NPP = negative predictive power; OR = odds ratio.

4. Discussion

In light of the estimated 34.6 million adults that received mental health care in 2014 [56] accurate self-report BPD screening measures could be a cost-effective solution. To date, no BPD screener has emerged as the gold standard because each self-report screener evaluated thus far has failed to produce an adequate balance of sensitivity and specificity [57]. In medical practice, screening tests are often used to make provisional diagnosis until more definitive diagnostic tests are completed. In the case of psychiatric emergency departments and outpatient clinics, relatively accurate screening tests could be used to screen out most individuals with questionable borderline personality disorders and identify the smaller percentage of adults who should undergo more costly diagnostic interviews.

The current results indicate that the BPD items from the SCIDII PQ and PID-5 BPD algorithm provided an adequate balance of specificity and sensitivity; therefore, these measures could be used to screen for BPD. From a clinical perspective, it is highly advantageous to identify patients who display borderline traits using relatively low cost screenings tests especially in psychiatric and general medical settings. The equivalent diagnostic accuracy of the PID-5 and SCID-II QP also add to a growing body of research that supports the clinical validity and utility of the PID-5. Furthermore, the results add to an emerging literature supporting the continuity between traditional diagnosis and the AMPD model of BPD. Continuity between models is particularly advantageous in that new knowledge emerging from AMPD research can be synthesized with accrued knowledge from clinical, neurobiological, and epidemiological findings based on DSM-IV derived BPD diagnoses. Potential clinical utility of the PID-5 algorithm includes a more nuanced profile of the elevated personality traits that may inform intervention selection, but this speculation must await future study.

Relative to a sample of medical screening tests (Table 2), the SCIP-II-QP and PID-5 demonstrate superior screening characteristics compared to urine dipstick test for urinary tract infection [58] and comparable performance to the Multi-Test II in screening for timothy grass allergy [59], and the rapid tests for human influenza [60]. BPD screening instruments were inferior to mammography for detecting breast cancer [61] and blood tests for detecting HIV infection [62]. Based upon this cursory review, it is clear that, from a psychometric perspective, BPD screening can be substantially improved and currently fails to meet the gold standard of the blood tests for HIV.

A factor that may significantly impede further progress in advancing BPD screening is the fact that the reliability of the

Table 2
Diagnostic and screening characteristics of medical tests.

Test	Sensitivity	Specificity
Borderline screening measures for adults		
PID-5	0.81	0.76
SCID-II questionnaire	0.78	0.80
Other medical tests		
Urine dipsticks in the diagnosis of UTI: Deville et al. (2004) meta-analysis of 35 studies	0.62	0.70
Multi-test II in assessing timothy grass allergy: Krouse et al. [59]	0.87	0.86
Rapid tests for human influenza: Hurt et al. [60]	0.67–0.71	0.99–1.0
Mammography for breast cancer: Kolb et al. [61]	0.78	0.99
Rapid HIV tests Branson (2014)		
OraQuick Avance (whole blood)	0.996	1.0
Uni-Gold Recombigen (whole blood)	1.0	0.997
Reveal G2 (serum)	0.998	0.991
Multispot (serum/plasma)	1.0	0.999

traditional polythetic approach to PD diagnosis is far from optimal. For example, the DSM 5 field trail yielded "questionable" inter-rater reliability (kappa = 0.34) across 11 academic centers in the US and Canada [63]. Furthermore, the DSM 5 polythetic system requiring five out of nine criteria to make a categorical BPD diagnosis results in massive heterogeneity within the disorder, thus increasing the complexity and error in determining a BPD diagnosis. It is important to note that the AMPD was designed to reduce overlap among personality disorder diagnoses, reduce heterogeneity within specific PD diagnoses, eliminate arbitrary diagnostic thresholds with little or no research basis, and provide diagnostic thresholds that are related to level of impairment in a meaningful way [64]. The current study provides the first data on research-derived cut-points for diagnostic thresholds for BPD based on PID-5 data; however, these findings require replication in general population and outpatient samples in order to justify clinical application. Future research applying the alternative model's diagnostic criteria utilizing PID-5 data to anchor Criteria B decision making may help to address the problem of overlap (co-occurrence) of personality disorders.

While the current findings hold considerable promise, there are notable limitations that bear mention. First, results may not generalize to community outpatient samples because the current inpatient sample was predominantly Caucasian, better educated, and less psychotic. Second, only three screening instruments were evaluated whereas there are numerous personality scales that may yield comparable or better diagnostic properties. Third, despite efforts to ensure diagnostic accuracy of BPD during SCID-II interviewing, the high rates of co-occurring mood and anxiety disorders, so prevalent in the entire field [45–49], may have attenuated the strength of prediction of the screening measures. Finally, the study design was limited to the measurement of Criteria B (personality trait criteria). The addition of measurement of Criteria A (impairment in self/interpersonal functioning) with the Level of Personality Functioning Scale [65] would provide a more robust assessment of the alternative model.

References

[1] American Psychiatric Association. DSM 5. American Psychiatric Association; 2013.
[2] Markon KE, Krueger RF. Information-theoretic latent distribution modeling: distinguishing discrete and continuous latent variable models. Psychol Methods 2006;11(3):228–43.
[3] Hopwood CJ, Zanarini MC. Borderline personality traits and disorder: predicting prospective patient functioning. J Consult Clin Psychol 2010;78(4):585–9.
[4] Spitzer RL, First MB, Shedler J, Westen D, Skodol AE. Clinical utility of five dimensional systems for personality diagnosis: a 'consumer preference' study. J Nerv Ment Dis 2008;196(5):356–74.
[5] Morey LC, Hopwood CJ, Gunderson JG, Skodol AE, Shea MT, Yen S, et al. Comparison of alternative models for personality disorders, II: 6-, 8- and 10-year follow-up. Psychol Med 2012;42(8):1705–13.
[6] Samuel DB, Widiger TA. Clinicians' judgments of clinical utility: a comparison of the DSM–IV and five-factor models. J Abnorm Psychol 2006;115:298–308.
[7] Samuel DB, Widiger TA. A meta-analytic review of the relationships between the five-factor model and DSM-IV-TR personality disorders: a facet level analysis. Clin Psychol Rev 2008;28:1326–42.
[8] Morey LC, Hopwood CJ, Gunderson JG, Skodol AE, Shea MT, Yen S, et al. Comparison of alternative models for personality disorders. Psychol Med 2007;37(7):983–94.
[9] Morey LC, Benson KT, Busch AJ, Skodol AE. Personality disorders in DSM-5: emerging research on the alternative model. Curr Psychiatry Rep 2015;17(4):1–9.
[10] Skodol AE, Gunderson JG, Shea MT, McGlashan TH, Morey LC, Sanislow CA, et al. The collaborative longitudinal personality disorders study (CLPS): overview and implications. J Pers Disord 2005;19:487–504.
[11] Widiger TA, Samuel DB. Diagnostic categories or dimensions? A question for the diagnostic and statistical manual of mental disorders-fifth edition. J Abnorm Psychol 2005;114:494–504.
[12] Kotov R, Gamez W, Schmidt F, Watson D. Linking "big" personality traits to anxiety, depressive, and substance use disorders: a meta-analysis. Psychol Bull 2010;136(5):768–821.
[13] Skodol AE, Clark LA, Bender DS, Krueger RF, Morey LC, Verheul R, et al. Proposed changes in personality and personality disorder assessment and diagnosis for DSM-5 part I: description and rationale. Personal Disord 2011;2(1):4–22.
[14] Skodol AE. Personality disorders in DSM-5. Annu Rev Clin Psychol 2012;8:317–44.
[15] Krueger RF, Derringer J, Markon KE, Watson D, Skodol AE. Initial construction of a maladaptive personality trait model and inventory for DSM-5. Psychol Med 2012;42:1879–90.
[16] Thomas KM, Yalch MM, Krueger RF, Wright AGC, Markon KE, Hopwood C. The convergent structure of DSM-5 personality trait facets and five-factor model trait domains. Assessment 2013;20:308–11.
[17] Anderson JL, Sellbom M, Bagby RM, Quilty LC, Veltri CO, Markon KE, et al. On the convergence between PSY-5 domains and PID-5 domains and facets: implications for assessment of DSM-5 personality traits. Assessment 2013;20:286–94.
[18] Ashton MC, Lee K, de Vries RE, Hendrickse J, Born MP. The maladaptive personality traits of the personality inventory for DSM-5 (PID-5) in relation to the HEXACO personality factors and schizotypy/dissociation. J Pers Disord 2012;26:641–59.
[19] Fossati A, Krueger RF, Markon KE, Borroni S, Maffei C. Reliability and validity of the personality inventory for DSM-5 (PID-5) predicting

DSM-IV personality disorders and psychopathy in community-dwelling Italian adults. Assessment 2013;20(6):689–708.
[20] Wright AGC, Pincus AL, Hopwood CJ, Thomas KM, Markon KE, Krueger RF. An interpersonal analysis of pathological personality traits in DSM-5. Assessment 2012;19:263–75.
[21] Fowler JC, Patriquin MA, Madan A, Allen JG, Frueh BC, Oldham JM. Incremental validity of the PID-5 in relation to the five factor model and traditional polythetic personality criteria of the DSM-5. Methods Psychiatr Res 2016, https://doi.org/10.1002/mpr.1526.
[22] Bach B, Sellbom M, Bo S, Simonsen E. Utility of DSM-5 section III personality traits in differentiating borderline personality disorder from comparison groups. Eur Psychiatry 2016;37:22.
[23] Fowler JC, Madan A, Allen JG, Ellis T, Mahoney J, Frueh BC, et al. Improvements in health related quality of life among seriously mentally ill individuals receiving inpatient treatment at a specialty hospital. J Clin Psychiatry 2015;76(5):471–8.
[24] Torgersen S. Prevalence, sociodemographics, and functional impairment. The American psychiatric publishing textbook of personality disorders. Arlington, VA: American Psychiatric Publishing; 2014. p. 109–29.
[25] Oldham JM. Borderline personality disorder and suicidality. Psychiatry 2006;163(1):20–6.
[26] Oldham JM. Guideline watch: practice guideline for the treatment of patients with borderline personality disorder. Focus 2005;3(3): 396–400.
[27] Pompili M, Girardi P, Ruberto A, Tatarelli R. Suicide in borderline personality disorder: a meta-analysis. Psychiatry 2005;59(5):319–24.
[28] Skodol AE, Gunderson JG, Pfohl B, Widiger TA, Livesley WJ, Siever LJ. The borderline diagnosis I: psychopathology, comorbidity, and personaltity structure. Biol Psychiatry 2002;51(12): 936–50.
[29] Bender DS, Dolan RT, Skodol AE, Sanislow CA, Dyck IR, McGlashan TH, et al. Treatment utilization by patients with personality disorders. Psychiatry 2001;158(2):295–302.
[30] Van Asselt AD, Dirksen CD, Arntz A, Severens JL. The cost of borderline personality disorder: societal cost of illness in BPD-patients. Eur Psychiatry 2007;22(6):354–61.
[31] Fowler JC, Oldham JM. Co-occurring disorders and treatment complexity within personality disorders. Focus 2013;11(2):123–8.
[32] Leichsenring F, Leibing E, Kruse J, New AS, Leweke F. Borderline personality disorder. Lancet 2011;377(9759):74–84.
[33] McMain S, Pos AE. Advances in psychotherapy of personality disorders: a research update. Curr Psychiatry Rep 2007;9(1): 46–52.
[34] Clarkin JF, Hull JW, Cantor J, Sanderson C. Borderline personality disorder and personality traits: a comparison of SCID-II BPD and NEO-PI. Psychol Assess 1993;5(4):472–6.
[35] Trull TJ, Widiger TA, Lynam DR, Costa Jr PT. Borderline personality disorder from the perspective of general personality functioning. Focus 2003;112(2):193–202.
[36] Morey LC, Zanarini MC. Borderline personality: traits and disorder. J Abnorm Psychol 2000;109(4):733–7.
[37] Distel MA, Trull TJ, Willemsen G, Vink JM, Derom CA, Lynskey M, et al. The five-factor model of personality and borderline personality disorder: a genetic analysis of comorbidity. Biol Psychiatry 2009;66(12):1131–8.
[38] First MB, Gibbon M, Spitzer RL, Williams JB. Structured clinical interview for DSM-IV Axis II personality disorders (SCID-II). Washington, DC: American Psychiatric Association; 2002.
[39] Ekselius L, Lindström E, Knorring LV, Bodlund O, Kullgren G. SCID II interviews and the SCID Screen questionnaire as diagnostic tools for personality disorders in DSM-III-R. Acta Psychiatr Scand 1994;90(2): 120–3.
[40] Jacobsberg L, Perry S, Frances A. Diagnostic agreement between the SCID-II screening questionnaire and the personality disorder examination. J Pers Assess 1995;65(3):428–33.
[41] Nussbaum D, Rogers R. Screening psychiatric patients for Axis II disorders. Psychiatry 1992;37:658–60.
[42] Germans S, Van Heck GL, Hodiamont PP. Results of the search for personality disorder screening tools: clinical implications. J Clin Psychiatry 2012;73:165–73.
[43] First, M. B., R. L. Spitzer, M. Gibbon, and J. B. W. William. Structured Clinical Interview fpr DSM-IV-TR Axis 1 disorders, Research Version, Patient Edition (SCID-I/P) New York, NY: New York State Psychiatric Institute, Biometric research;. 73 Maxwell, M. Bethesda, MD 2002;1992.
[44] Pilkonis PA, Heape CL, Proietti JM, Clark SW, McDavid JD, Pitts TE. The reliability and validity of two structured diagnostic interviews for personality disorders. Arch Gen Psychiatry 1995;52: 1025–33.
[45] Goodman M, New AS, Triebwasser J, Collins KA, Siever L. Phenotype, endophenotype, and genotype comparisons between borderline personality disorder and major depressive disorder. J Pers Disord 2010;24(1):38–59.
[46] Koenigsberg HW, Harvey PD, Mitropoulou V, Schmeidler J, New AS, Goodman M, et al. Characterizing affective instability in borderline personality disorder. Psychiatry 2002;159(5): 784–8.
[47] Skodol AE, Stout RL, McGlashan TH, Grilo CM, Gunderson JG, Shea MT, et al. Co-occurrence of mood and personality disorders: a report from the collaborative longitudinal personality disorders study(CLPS). Depress Anxiety 1999;10(4):175–82.
[48] Zanarini MC, Frankenburg FR, Hennen J, Reich DB, Silk KR. Axis I comorbidity in patients with borderline personality disorder: 6-year follow-up and prediction of time to remission. Psychiatry 2004;161(11):2108–14.
[49] Akiskal HS, Chen SE, Davis GC, Puzantian VR, Kashgarian M, Bolinger JM. Borderline: an adjective in search of a noun. J Clin Psychiatry 1985;46:41–8.
[50] John OP, Naumann LP, Soto CJ. Paradigm shift to the integrative big five trait taxonomy. Handbook of personality: theory and research, vol. 3; 2008114–58.
[51] Few LR, Miller JD, Rothbaum AO, Meller S, Maples J, Terry DP, et al. Examination of the section III DSM-5 diagnostic system for personality disorders in an outpatient clinical sample. J Abnorm Psychol 2013;122(4):1057.
[52] Hopwood CJ, Thomas KM, Markon KE, Wright AG, Krueger RF. DSM-5 personality traits and DSM–IV personality disorders. J Abnorm Psychol 2012;121(2):424.
[53] Wright AG, Calabrese WR, Rudick MM, Yam WH, Zelazny K, Williams TF, et al. Stability of the DSM-5 section III pathological personality traits and their longitudinal associations with psychosocial functioning in personality disordered individuals. J Abnorm Psychol 2015;124(1):199.
[54] Kessel JB, Zimmerman M. Reporting errors in studies of the diagnostic performance of self-administered questionnaires: extent of the problem, recommendations for standardized presentation of results, and implications for the peer review process. Psychol Assess 1993;5(4):395.
[55] Streiner DL. Diagnosing tests: Using and misusing diagnostic and screening tests. J Pers Assess 2003;81(3):209–19.
[56] Han B, Hedden SL, Lipari R, Copello EA, Kroutil LA. Receipt of services for behavioral health problems: results from the 2014 National Survey on Drug Use and Health. Rockville (MD): Substance Abuse and Mental Health Services Administration; 2015.
[57] Vach W, Gerke O, Høilund-Carlsen PF. Three principles to define the success of a diagnostic study could be identified. J Clin Epidemiol 2012;65(3):293–300.
[58] Devillé WL, Yzermans JC, Van Duijn NP, Bezemer PD, Van Der Windt DA, Bouter LM. The urine dipstick test useful to rule out infections. A meta-analysis of the accuracy. BMC Urol 2004;4(1):4.

[59] Krouse JH, Sadrazodi K, Kerswill K. Sensitivity and specificity of prick and intradermal testing in predicting response to nasal provocation with timothy grass antigen. Otolaryngol Head Neck Surg 2004;131(3):215–9.
[60] Hurt AC, Alexander R, Hibbert J, Deed N, Barr IG. Performance of six influenza rapid tests in detecting human influenza in clinical specimens. J Clin Virol 2007;39(2):132–5.
[61] Kolb TM, Lichy J, Newhouse JH. Comparison of the performance of screening mammography, physical examination, and breast us and evaluation of factors that influence them: an analysis of 27,825 patient evaluations 1. Radiology 2002;225(1):165–75.
[62] Branson BM. Rapid HIV testing: 2005 update. Atlanta, GA: Centers for Disease Control; 2005.
[63] Regier DA, Narrow WE, Clarke DE, Kraemer HC, Kuramoto SJ, Kuhl EA, et al. DSM-5 field trials in the United States and Canada, part II: test-retest reliability of selected categorical diagnoses. Psychiatry 2013;170(1):59–70.
[64] Morey LC, Skodol AE. Convergence between DSM-IV-TR and DSM-5 diagnostic models for personality disorder: evaluation of strategies for establishing diagnostic thresholds. J Psychiatr Pract 2013;19(3):179–93.
[65] Morey LC, Berghuis H, Bender DS, Verheul R, Krueger RF, Skodol AE. Toward a model for assessing level of personality functioning in DSM–5, part II: empirical articulation of a core dimension of personality pathology. J Pers Assess 2011;93(4):347–53.