Personality and Mental Health
Personality and Mental Health
(2018)
Published online in Wiley Online Library
(wileyonlinelibrary.com) DOI 10.1002/pmh.1434

The Level of Personality Functioning Scale-Brief Form 2.0: Update of a brief instrument for assessing level of personality functioning

LAURA C. WEEKERS[1], JOOST HUTSEBAUT[1] AND JAN H. KAMPHUIS[1,2], [1]Viersprong Institute for Studies on Personality Disorders, Halsteren, The Netherlands; [2]Department of Clinical Psychology, University of Amsterdam, Amsterdam, The Netherlands

ABSTRACT

Section III of the Diagnostic and Statistical Manual of Mental Disorders (5th ed.) introduced the alternative model of personality disorders that includes assessing levels of personality functioning. Here, we describe the development, preliminary psychometric evaluation and sensitivity to change of a revised brief self-report questionnaire, the Level of Personality Functioning Scale-Brief Form 2.0 (LPFS-BF 2.0). Patients (N = 201) referred to a specialized centre for the assessment and treatment of personality disorders completed the LPFS-BF 2.0, the Brief Symptom Inventory and the Severity Indices of Personality Problems Short Form and were administered the Structured Clinical Interview for DSM-IV Axis I and Axis II Disorders. Internal structure and aspects of construct validity were examined. A subsample of 39 patients also completed the questionnaires after 3 months of inpatient treatment. Confirmatory factor analyses demonstrated better fit for a two-factor solution (interpretable as self-functioning and interpersonal functioning) than for a unidimensional model, though acceptable model fit was evident only after two post hoc modifications. The LPFS-BF 2.0 demonstrated satisfactory internal consistency and promising construct validity. Sensitivity to change after 3 months of treatment was high. The LPFS-BF 2.0 constitutes a short, user-friendly instrument that provides a quick impression of the severity of personality pathology. © 2018 John Wiley & Sons, Ltd.

Introduction

The Level of Personality Functioning Scale (LPFS) was introduced in the alternative model for personality disorders (PDs) in DSM-5[1] to provide a measure for the assessment of impairments in personality functioning. The model builds upon the assumption that all types of PDs are characterized by 'essential commonalities' with regard to moderate or more severe limitations in self and interpersonal functioning.[2,3] These 'commonalities' are thought to be reflected by 12 facets, including impairments in identity (experience of oneself as unique, stability of self-esteem and capacity for and ability to regulate a range of emotional experience), self-direction (pursuit of coherent and meaningful goals, constructive and prosocial internal standards of behaviour and self-reflection), empathy (comprehension and appreciation of others' experiences and motivations, tolerance of differing perspectives and understanding the effects of one's own behaviour on others) and intimacy (depth

and duration of connection with others, desire and capacity for closeness and mutuality of regard). The LPFS identifies five levels of functioning for each of these 12 facets, offering a severity index for personality pathology. The addition of a severity dimension is seen as a major addition to the traditional assessment of maladaptive personality traits. Severity of personality pathology is a strong predictor of current and future functioning[4] and likely has greater impact on treatment planning and course of treatment than the particular type of personality problems.[4–7] Although the LPFS is described in the DSM-5 as a unidimensional construct, studies to date yielded inconsistent factor structures. Morey[8] found a single factor solution and thus argued that Criterion A is a unidimensional construct. Zimmerman *et al.*[9], however, concluded that the LPFS was best conceptualized as a two-dimensional construct. They found two distinct factors: self-functioning and interpersonal functioning. This is in line with a study by Berghuis *et al.*[10], which corroborated the two factors of the General Assessment of PDs: self-pathology and interpersonal pathology. Bastiaansen *et al.*[11] used the Severity Indices of Personality Problems 118 to assess the LPFS and concluded that the LPFS consists of four-factors, that is, self-control, identity integration, relational functioning and responsibility. Previous research on the structure of the Severity Indices of Personality Problems 118 by Verheul *et al.*[12] yielded a five-factor solution. In sum, the results to date are inconclusive with regard to the structure of Criterion A of the Alternative Model of Personality Disorder (AMPD) (i.e. levels of personality functioning). In addition to the LPFS, the alternative model for PDs included 25 pathological personality traits, organized by five higher order domains (negative affectivity, detachment, antagonism, disinhibition and psychoticism) for which the Personality Inventory for DSM-5 was proposed as assessment instrument.[13]

The alternative model of PD was primarily designed to meet the shortcomings regarding validity and clinical utility of the prevailing model. However, soon after publication, concerns were raised concerning the presumed complexity of the model. Indeed, findings with regard to the application of the LPFS revealed some mixed results when using clinical interview data or Structured Clinical Interview for DSM data.[14,15] On the other hand, other studies demonstrated the model lends itself well for instruction, such that graduate students and inexperienced raters were able to apply the model with adequate interrater reliability.[16–18] An important way to improve clinical utility and ease of use is to develop assessment instruments for assessing the LPFS and pathological personality traits. Since its publication, several instruments for assessing the LPFS have been developed independently by different research groups, including two interview schedules[3,14] and (at least) three self-report questionnaires. Huprich *et al.*[19] developed the DSM-5 Levels of Personality Functioning Questionnaire (DLOPFQ), a 132-item questionnaire assessing the LPFS in both social and work/school domains. Initial results were promising, with high internal consistency rates and conceptually relevant correlations with maladaptive personality traits and overall well-being. Morey[8] developed the Level of Personality Functioning Scale-self report (LPFS-SR), an 80-item self-report scale. The LPFS-SR includes items for each marker of severity as proposed by the LPFS, leading up to 80 items to represent 60 descriptions of severity. The LPFS-SR demonstrated high internal consistency, high test–retest reliability, high intercorrelations between each of its dimensions and high correlations with related instruments.[8,20]

Our group developed the Level of Personality Functioning Scale-Brief Form (LPFS-BF).[21] This instrument was initially developed as a quick screening tool related to the LPFS. Our primary aim was to formulate one item for each facet of the LPFS, yielding a global estimate of impairment related to personality functioning. The LPFS-BF thus became a very brief instrument, including only 12 items to be rated 'yes' or 'no'. Therefore, both the LPFS-BF and LPFS-sr may have different areas of application, with the LPFS-BF offering a 'quick and dirty' assessment of general impairment in

DOI: 10.1002/pmh

personality functioning, while the LPFS-SR might enable a more precise and detailed assessment of different domains of personality functioning.[8]

Although the LPFS-BF was initially developed to only serve as a website screening tool for patients to self-assess whether their problems might be related to personality dysfunction, the instrument showed acceptable psychometric properties. It yielded a clear two-factor solution, resembling self and interpersonal domains, and the internal consistencies in a sample of patients with personality pathology were borderline acceptable, with coefficient αs of 0.69 for the total score and 0.57 and 0.65 for the subscales, respectively.[21] With regard to construct validity, the LPFS-BF scores were associated as expected with related measures of personality pathology. On the other hand, analyses also demonstrated that some items of the original scale did not perform well, specifically item 6 (I am often very strict with myself, referring to impairments in constructive and prosocial internal standards of behaviour as an aspect of self-direction) and item 11 (There is almost no one who is really close to me, referring to impairments in desire and capacity for closeness as an aspect of intimacy). The item-total correlation of these questions was low, and deletion of these items resulted in better internal consistency. With the newly formulated item 11, we tried to capture the subjective sense of a lack of safety in close relationships, which is characteristic of more severe disturbance in the closeness facet. The reformulated item now reads as 'I often feel very vulnerable when relations become more personal'. We reformulated item 6 to capture a more severe level of self-direction: 'I often make unrealistic demands on myself'. Furthermore, (only) one of the initial items (item 4) was reversed (*I have clear aims in my life and succeed in achieving these*, referring to 'goals' as an aspect of self-direction). However, as the absence of health might not necessarily equal the presence of pathology and vice versa, we changed the reversed item. The updated LPFS-BF 2.0 therefore consists of nine of the original items and three reformulated items.

In addition, to improve psychometric functioning, we opted for a response scale instead of a binary yes/no response format. This modification related to our aim of expanding the use of the LPFS-BF 2.0 as a screening tool to a tool for assessing changes in personality functioning during treatment. Assessing (lack of) progress during treatment is increasingly included in treatments of mental disorders in order to inform treatment decisions, for example, reformulating treatment goals or terminating treatment.[22,23] In the Netherlands, routine outcome monitoring (ROM) was introduced nationwide in 2011 and typically consists of systematic periodic data collection on the mental health and level of functioning of patients as an indicator of treatment outcome.[24,25] Although using ROM during treatment to inform treatment decisions is considered clinically useful by its advocates, several prominent clinical researchers have raised concern about indiscriminate use of ROM for benchmarking (using ROM data to compare treatment results),[26,27] potential bias, confounds and the need for disorder-specific instruments to more accurately assess the complexity of what constitutes treatment outcome. Moreover, implementation of disorder-specific instruments in treatment for PDs is hindered by lack of data on sensitivity to change for most personality questionnaires, and many conceptually relevant questionnaires are too lengthy for multiple assessments over treatment. By including a response scale—similar to the Personality Inventory for DSM-5 response scale—we intended to increase variation in responses and therefore facilitate sensitivity of the instrument to identify relevant changes in personality functioning during treatment.

In sum, this study investigated aspects of reliability and construct validity of the updated version of the LPFS-BF[21], the LPFS-BF 2.0. We expected the internal structure of the LPFS-BF 2.0 to reflect two intercorrelated, internally consistent factors corresponding to self-functioning and interpersonal functioning domains. Futhermore, we expected conceptually meaningful associations with related measures of personality functioning,

DOI: 10.1002/pmh

the Severity Indices of Personality Functioning Short Form (SIPP-SF) and the DSM-IV-TR PDs. With respect to ROM purposes, we tested associations with a widely used routine outcome measuring questionnaire, the Brief Symptom Inventory (BSI)[28] and compared their respective sensitivities to change in the context of a residential treatment programme for PD.

Method

Participants

Two subsamples of patients were used in the analysis. All participants were treatment-seeking adults who were referred to *de Viersprong*, a specialized mental health care centre for the assessment and treatment of adolescents and adults with PDs. The first sample of 201 participants completed the LPFS-BF 2.0 as part of the standard admission procedure. All intakes took place between April 2016 and February 2017. About two-thirds of the total sample (n = 131; 65.2%) were female. Patients' age ranged from 18 to 62 years old, with a mean age of 36.2 (standard deviation (SD) = 11.0). Clinical characteristics of the participants are presented in Table 1; for 18 participants, data on clinical characteristics were missing. Most patients met criteria for at least one PD (90.7%), with borderline and PD not otherwise specified (PD-NOS) being the most prevalent PDs. The second sample of 47 participants was administered the LPFS-BF 2.0 at the start of their 3-month residential treatment programme, based on a transactional analysis treatment model.[29] The comprehensive treatment programme specifically targeted patients with a cluster C PD and includes psychotherapy, psychomotor and art therapy, sociotherapy and milieu therapy. Questionnaires were collected between September 2016 and November 2017. Clinical characteristics of the second sample are presented in Table 1; data were missing for one participant. Thirty-nine of the 47 participants also completed the LPFS-BF 2.0 at the end of treatment. These data were used in the subsequent (treatment responsivity) analyses.

Table 1: Diagnostic characteristics of Samples 1 and 2

DSM-IV-TR diagnosis	Sample 1 (N = 183) N (%)	Sample 2 (N = 46) N (%)
Personality disorders		
Avoidant PD	40 (21.9)	29 (63)
Dependent PD	5 (2.7)	1 (2.2)
Obsessive–compulsive PD	24 (13.1)	9 (19.6)
Paranoid PD	3 (1.6)	0 (0)
Histrionic PD	1 (0.5)	0 (0)
Narcissistic PD	9 (4.9)	3 (6.5)
Borderline PD	63 (34.4)	7 (15.2)
Antisocial PD	5 (2.7)	0 (0)
PD-NOS	81 (44.3)	21 (45.7)
Any PD	166 (90.7)	44 (95.7)
Clinical disorders		
Mood disorder	97 (64.2)	24 (52.2)
Anxiety disorder	65 (36.3)	14 (30.4)
Substance use disorder	19 (11.8)	2 (4.3)
Psychotic disorder	1 (0.5)	0 (0)
Somatoform disorder	19 (10.4)	4 (8.7)
Eating disorder	16 (9)	3 (6.5)
Any Axis-I disorder	142 (86.1)	34 (79.1)

Note: The sum of the number of patients across the different diagnostic groups is higher than the total number of patients because of comorbidity.
NOS, not otherwise specified; PD, personality disorder.

Measures

Level of Personality Functioning Scale-Brief Form 2.0. The LPFS-BF 2.0 is a brief self-report questionnaire, which assesses the LPFS as described in Section III of the DSM-5.[1] The LPFS consists of 12 items, clustered into two higher order domains: self-functioning and interpersonal functioning. Participants are asked to rate the 12 items on a 4-point Likert scale from 1 (completely untrue) to 4 (completely true). Table 2 shows the distribution of responses of all items in the current sample.

Structured Clinical Interview for DSM-IV Axis I Disorders. The Structured Clinical Interview for DSM-IV Axis I Disorders[30,31] is a semi-structured interview designed to assess the

DOI: 10.1002/pmh

Table 2: Distribution of LPFS-BF 2.0 responses (N = 201)

	Mean	SD
1. I often do not know who I really am	3.04	1.01
2. I often think very negatively about myself	3.49	0.77
3. My emotions change without me having a grip on them	3.27	0.87
4. I have no sense of where I want to go in my life	3.17	0.92
5. I often do not understand my own thoughts and feelings	3.14	0.90
6. I often make unrealistic demands on myself	3.10	0.87
7. I often have difficulty understanding the thoughts and feelings of others	2.17	1.03
8. I often find it hard to stand it when others have a different opinion	2.46	1.00
9. I often do not fully understand why my behaviour has a certain effect on others	2.33	0.97
10. My relationships and friendships never last long	2.29	1.07
11. I often feel very vulnerable when relations become more personal	3.20	0.95
12. I often do not succeed in cooperating with others in a mutually satisfactory way	2.14	0.99

Note: LPFS-BF 2.0, Level of Personality Functioning Scale-Brief Form 2.0; SD, standard deviation.

DSM-IV Axis I disorders. The Structured Clinical Interview for DSM-IV Axis I Disorders has demonstrated good interrater reliability in a diversity of samples, especially when interviewers had received a formal training; overall kappa was 0.85.[32]

Structured Clinical Interview for DSM-IV Axis II Personality Disorders. The Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II)[33,34] was used to diagnose DSM-IV Axis II PDs. The Axis II PD criteria were largely kept unchanged in DSM-5 allowing the SCID-II to assess also DSM-5 PDs. Criteria were scored when the clinician deemed sufficient evidence present that the targeted behaviours were present, as well as pathological, pervasive and persistent. PD-NOS was classified when five criteria from PDs were present.[35] The SCID-II has good interrater and test–retest reliability in PD samples[36,37] with sum intraclass correlation coefficients reported as high as 0.90 for avoidant and 0.95 for borderline PD in a Dutch sample.[38]

Brief Symptom Inventory. The BSI[28,39] was used to assess symptom severity. It consists of 53 items covering nine symptom dimensions (i.e. somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism). The present study only utilized the BSI total score, which provides an index of the intensity of distress by psychological symptoms during the past week. Respondents rate each item on a 5-point scale ranging from 0 (not at all) to 4 (extremely). Cronbach's α in the present sample was 0.95.

Severity Indices of Personality Problems. The SIPP-SF[12,40] is a dimensional self-report measure designed to assess core components of (mal-)adaptive personality functioning. The 60-item SIPP-SF asks respondents to think back to the past 3 months and indicate the extent to which they agree with the presented statements. The response categories range from 1 to 4 and are described as fully disagree, partly disagree, partly agree and fully agree. The measure comprises five higher order domains labelled: (a) self-control, (b) identity integration, (c) relational capacities, (d) responsibility and (e) social concordance. High scores indicate better adaptive functioning. The comprising SIPP-SF subscales have generally yielded adequate to strong internal consistencies in PD samples, with Cronbach's α ranging from 0.62 to 0.89.[12,40] In the current sample, α scores ranged from 0.83 to 0.89.

DOI: 10.1002/pmh

Results

Internal structure

To test the hypothesized two-factor model of the LPFS, and compare this fit to a unidimensional rendering of personality dysfunctioning, we conducted confirmatory factor analyses using MPLUS 7.[41] Model fit was evaluated by using absolute fit indices including the root mean square error of approximation (RMSEA) and standardized root mean residual (SRMR) and relative fit indices including the confirmatory fit index (CFI) and the Tucker–Lewis index (TLI). We followed common guidelines for the interpretation of fit, with RMSEA and SRMR values of 0.05–0.08 suggesting acceptable fit and CFI and TLI values of 0.90–0.95, respectively.[42,43] The chi-square statistic is also reported, but this statistic is generally considered less useful for the evaluation of model fit as it is overly sensitive to sample size.

Table 3 reports the fit indices of the alternative models. First, we tested a one-factor model in line with previous research suggesting the LPFS is a unidimensional construct.[8] All fit indices indicated a poor fit to the data. Next, we tested the hypothesized two-factor model of the LPFS-BF 2.0 (self-functioning and interpersonal functioning). This improved model fit considerably, though all fit indices remained below acceptable levels. Closer inspection of fit indices led to subsequent respecifications of the model, particularly with respect to the two-factor solution. Specifically, the modification indices suggested that item 11 ('I often feel very vulnerable when relations become more personal') was highly correlated to factor 1 (self-functioning) and that specification of a crossloading of item 11 on factor 1 would improve fit. Moreover, allowing the error terms of items 10 and 11 to correlate would also enhance model fit. We tested these modifications in subsequent models 3 and 4. Fit indices for model 3 were generally below acceptable thresholds, whereas for model 4, absolute fit (as measured by RMSEA and SRMR) was acceptable, with relative fit indices slightly below (TLI) or above (CFI) customary thresholds. The *post hoc* modifications made conceptual sense, as item 11 mentions feelings of vulnerability that (also) map onto deficits in self-functioning (model 3), and both item 10 and item 11 have a unique feature in introducing the context (and key word) of 'relationship', beyond the specification of experienced difficulties in core tasks of personality functioning (model 4). Model 4 is shown in Figure 1. Of note, the LPFS-BF 2.0 showed robustness in that analyses with and without item 11 yielded highly similar results. The internal consistency estimates for the LPFS-BF 2.0 were high, with $\alpha = 0.82$ for the total scale and $\alpha = 0.79$ and $\alpha = 0.71$ for the self-functioning and interpersonal functioning scales. Correlation

Table 3: Confirmatory factor analyses: fit indices for alternative model specifications

	χ^2	d.f.	RMSEA	90% CI	SRMR	TLI	CFI
Model 1 (one factor: unidimensional model)	229.802	54	0.127	0.111; 0.144	0.096	0.646	0.710
Model 2 (two factors: self-functioning and interpersonal functioning)	145.294	53	0.093	0.075; 0.111	0.083	0.811	0.848
Model 3 (two factors: self-functioning and interpersonal functioning; crossloadings 11 on factor 1)	120.198	52	0.081	0.062; 0.100	0.066	0.857	0.888
Model 4 (two factors: crossloadings 11 on factor 1, correlated errors 10–11)	106.282	51	0.073	0.054; 0.093	0.061	0.882	0.909

Note: CI, confidence interval; CFI, comparative fit index; d.f., degrees of freedom; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker–Lewis index.

DOI: 10.1002/pmh

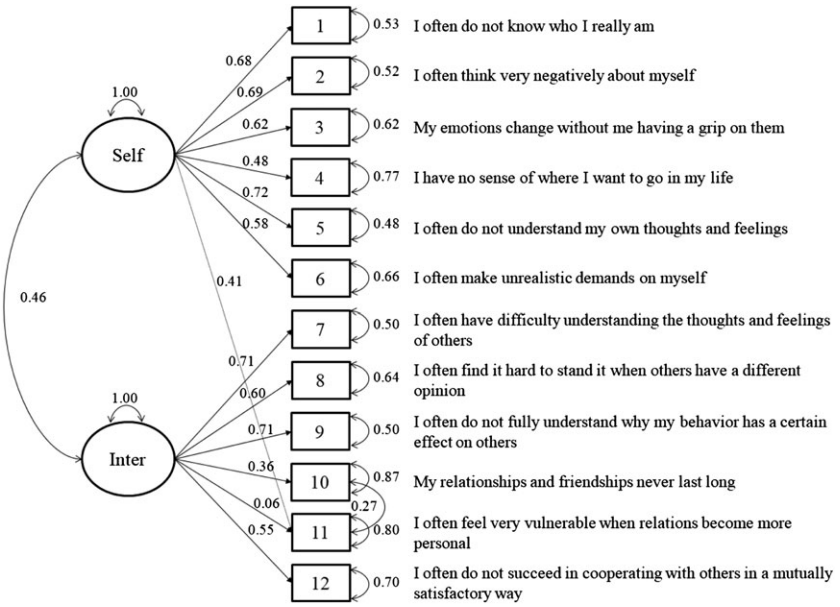

Figure 1: Level of Personality Functioning Scale-Brief Form 2.0 final model after confirmatory factor analyses. Self, self-functioning domain; Inter, interpersonal functioning domain

between the self-functioning and interpersonal functioning scales was moderate (r = 0.44).

Construct validity

Small to moderate associations were observed between the LPFS-BF 2.0 and severity of PD, as measured by the number of PD diagnoses (r = 0.33, r = 0.27 and r = 0.28 for the total, self and interpersonal scales, respectively). In addition, the number of PD criteria was significantly associated with the LPFS-BF 2.0 (r = 0.38, r = 0.33 and r = 0.30 for the total, self and interpersonal scales, respectively). We also assessed whether the LPFS-BF 2.0 differentiated between patients with and without a borderline PD, as several studies indicate borderline PD may be considered a measure of general severity.[44,45] In our sample, 63 patients met criteria for a borderline PD and 138 patients did not meet criteria for borderline PD (Table 1 for the distribution of PD diagnoses in our sample). An independent samples t-test showed a significant difference on the LPFS-BF 2.0 between patients with a borderline PD (M = 37, SD = 5.72) and without a borderline PD (M = 32.38, SD = 5.72; $t = -5.07$, $p < 0.001$).

The LPFS-BF 2.0 showed moderate correlations with the BSI and SIPP-SF domains (Table 4). All correlations were significant at $p < 0.01$. The BSI and SIPP identity integration domain were more strongly related to the LPFS-BF 2.0 self-functioning domain than the LPFS-BF 2.0 interpersonal functioning domain (z = 2.82, p = 0.005 and z = 5.74, $p < 0.001$ respectively). In addition, the SIPP social concordance domain had a stronger relationship with the LPFS-BF 2.0 interpersonal functioning domain than the self-functioning domain (z = 6.69, $p < 0.001$). No differences were found for other SIPP domains. To test whether the LPFS-BF 2.0 and the SIPP are exclusively correlated due to shared general psychopathology variance, we assessed their relationship while controlling for the BSI by calculating partial correlations. The LPFS-BF 2.0 total score remained significantly correlated to all SIPP-SF domains. After controlling for BSI scores, correlations of LPFS-BF 2.0 self-functioning score and the SIPP self-control

DOI: 10.1002/pmh

Table 4: Pearson correlations with self-report measures of personality problems and symptom severity (N = 182–187)[1]

	SIPP-SF self-control	SIPP-SF identity integra-tion	SIPP-SF responsibility	SIPP-SF relational capacities	SIPP-SF social concordance	BSI total score
LPFS-BF 2.0 total	−0.50	−0.50	−0.37	−0.49	−0.52	0.56
LPFS-BF 2.0 self-functioning	−0.38	−0.62	−0.29	−0.38	−0.24	0.57
LPFS-BF 2.0 interpersonal functioning	−0.48	−0.25	−0.36	−0.48	−0.66	0.39
Diff (p)	0.10	<0.001**	0.31	0.15	<0.001**	0.005**

Note: BSI, Brief Symptom Inventory; Diff (p) = p-value of difference between self-functioning and interpersonal functioning domains; LPFS-BF 2.0, Level of Personality Functioning Scale-Brief Form 2.0.; SIPP-SF, Severity Indices of Personality Problems Short Form.
[1]N varies due to missing values.
**$p < 0.01$.

and social concordance domains were no longer significant. For the LPFS-BF 2.0 interpersonal functioning score, only the correlation with the identity integration domain was no longer significant.

Sensitivity to change

Sensitivity to change is the ability of an instrument to detect changes when these occur. Three methods have been described to assess sensitivity to change[46]: [1] effect sizes ($M2 - M1/SD1$; $M1$ = mean at time 1, $M2$ = mean at time 2, $SD1$ = standard deviation at time 1)[47], [2] standardized response mean ($M2 - M1/SDdiff$; $SDdiff$ = standard deviation of score changes)[48] and [3] responsiveness index ($M2 - M1/SDstable$; $SDstable$ = standard deviation in unchanged subjects).[49] There currently is no consensus about the best measure of sensitivity to change. We calculated both effect sizes (Cohen's d) and the standardized response mean to assess sensitivity to change of the LPFS-BF 2.0. Because results were very similar, we chose to only report Cohen's d. Table 5 shows a summary of the main findings. Mean time between start and end of treatment was 92.13 days (SD = 14.55). The LPFS-BF 2.0 shows high sensitivity to change, yielding an effect size of d = 1.05 at the end of the 3-month inpatient treatment. Effect size of the LPFS-BF 2.0 was comparable with or higher than other measures commonly used for ROM (BSI and SIPP-SF). The self-functioning domain of the LPFS-BF 2.0 appeared to be especially sensitive to change, yielding an effect size of d = 1.22. Rank order stability measured by pre post correlations is also reported in Table 5. Because of lack of power, no meaningful comparison of these estimates across instruments is possible in the present sample, but moderate rank order stability across respondents and instruments can be observed.

Discussion

In this study, we tested the factor structure, reliability, construct validity and sensitivity to change of the LPFS-BF 2.0 in two samples of PD patients. In line with our previous study,[21] the structure of the LPFS-BF 2.0 total scale grossly adhered to two meaningful subscales: self-functioning and interpersonal functioning. Distribution of the items over the subscales was mostly in line with what was expected, supporting the content validity of the LPFS-BF 2.0. Moreover, internal consistencies of the LPFS-BF 2.0 were satisfactory for both the total scale and the self-functioning and interpersonal functioning subscales. However, one item (item 11) hypothesized to load on the interpersonal functioning domain, loaded on the

DOI: 10.1002/pmh

Table 5: Sensitivity to change of the LPFS-BF 2.0 and related constructs (N = 36–39)[1]

	Start of treatment M (SD)	End of treatment M (SD)	Pre–post correlation	Change score M (SD)	*p*-value	Effect size (*d*)
LPFS-BF 2.0 total	30.54 (5.83)	24.23 (6.32)	0.49	6.31 (6.15)	<0.001	1.05
LPFS-BF 2.0 self-functioning	17.54 (3.79)	12.73 (4.19)	0.47	4.81 (4.14)	<0.001	1.22
LPFS-BF 2.0 interpersonal functioning	13.05 (3.09)	11.46 (3.26)	0.51	1.59 (3.13)	0.003	0.51
SIPP-SF self-control[2]	35.67 (6.60)	38.61 (7.05)	0.53	−2.94 (6.65)	0.012	0.44
SIPP-SF identity integration	25.89 (9.0)	34.36 (8.57)	0.72	−8.47 (6.59)	<0.001	0.98
SIPP-SF responsibility	35.33 (7.49)	37.81 (5.92)	0.70	−2.47 (5.41)	0.010	0.37
SIPP-SF relational capacities	28.64 (8.25)	33.72 (8.37)	0.68	−5.08 (6.66)	<0.001	0.62
SIPP-SF social concordance	36.94 (6.46)	38.53 (6.58)	0.66	−1.58 (5.34)	0.084	0.25
BSI	1.40 (0.66)	0.79 (0.58)	0.47	0.61 (0.64)	<0.001	1.0

Note: LPFS-BF 2.0, Level of Personality Functioning Scale-Brief Form 2.0.; SD, standard deviation; SIPP-SF, Severity Indices of Personality Problems Short Form.

[1]N varies due to missing values.

[2]SIPP-SF scores are T-scores, comparing the scores to the normal population, with higher scores reflecting more adaptive functioning ($T < 30$ very low, T = 30–40 low, T = 40–60 average, T = 60–70 high and $T > 70$ very high).

self-functioning domain ('I often feel very vulnerable when relationships become more personal'). In retrospect, this item, especially its first part, might also tap (deficits in) emotion regulation, an aspect of self-functioning. Future translations and adaptations may consider modifying this item to more accurately reflect its interpersonal facet origin. On the other hand, it is noteworthy that Zimmerman *et al.*[9] found a similar deviation from the original theoretical model in an observer-report questionnaire. In their study, the depth and duration of connections facet (most equivalent to item 10 of the LPFS-BF 2.0) was more indicative of self-functioning than interpersonal functioning, and the desire and capacity for closeness (counterpart of item 11 of the LPFS-BF 2.0) was equally related to self-functioning and interpersonal functioning.

Conceptually, meaningful associations were observed between the LPFS-BF 2.0 and other measures of severity of PDs. As expected, the SIPP identity integration domain was more strongly related to the LPFS-BF 2.0 self-functioning domain, whereas the SIPP social concordance domain had the strongest relationship with the interpersonal functioning domain of the LPFS-BF 2.0. Associations between number of PDs and number of PD criteria were moderate. Patients with a borderline PD showed higher impairment scores than patients without a borderline PD. In line with previous research, borderline PD appears to be a general marker of severity of personality pathology.[44] Conceptually, borderline PD and the LPFS show considerable overlap; borderline PD is often conceptualized as a disorder of self-dysfunction and interpersonal dysfunction.[45] The self-functioning and interpersonal functioning subscales showed positive associations with similar constructs as measured by the SIPP-SF, with the identity integration subscale of the SIPP-SF showing a stronger relationship with the self-functioning domain and the social concordance subscale showing a stronger relationship with the interpersonal functioning domain. These findings support the construct validity of the scale.

The LPFS-BF 2.0 showed high sensitivity to change, reflected by a high effect size after 3 months of inpatient treatment. The LPFS-BF 2.0 was as sensitive (total score) or more sensitive (self-functioning domain) to change than the BSI and more sensitive to change than most SIPP-SF domains, providing preliminary evidence that, at least from a perspective of sensitivity to change, the LPFS-BF 2.0 may serve as an ROM instrument

DOI: 10.1002/pmh

in patients with PDs. That said, it warrants mentioning that many other conditions need to be met before such use can become good practice (see, e.g. van Os *et al.*[27]). Notably, the LPFS-BF 2.0 showed sensitivity to change commensurate with the BSI (measuring symptom distress). As personality syndromes are generally presumed to be more stable than symptom syndromes, this finding warrants further study. It may be explained by the efficacy or the treatment programme focusing on personality problems, but it may also point to shared variance with symptom distress. Intercorrelations between the measures were moderate, with the interpersonal facet of the LPFS being more distinct. Future studies should also include the sustainability of the changes after treatment, by including follow-up assessments of level of personality functioning and assessing the presence of PD diagnoses after treatment has been completed.

Some limitations should be kept in mind, most notably the restricted range of PD types within this sample, with virtually no Cluster A PD present and very few antisocial PD, dependent PD and histrionic PD, along with a predominance of borderline PD, PD-NOS and avoidant PD diagnoses. To mitigate this concern, this composition is consistent with most reported research in non-forensic mixed samples of PD.[50] Secondly, although there were multiple instances of the SIPP-SF domains showing discriminant relationships with the LPFS-BF 2.0 self-functioning and interpersonal functioning domains, this was not the case for three of the five domains. Several factors may account for this lack of discriminative associations. First, the concepts operationalized by both the LPFS-BF 2.0 and the SIPP are clinically 'rich' concepts, which tends to complicate the inherent trade-off between coverage and clarity of factor structure. Second, it is also possible that the brevity of the LPFS-BF 2.0 limits its ability to discriminate between interpersonal functioning and self-functioning. The longer LPFS-SR, for example, showed higher correlations with the SIPP domains and other questionnaires measuring personality functioning.[8] Also, compared with the original LPFS-BF, we deleted all reversed items to reflect the notion that absence of health does not necessarily equal the presence of pathology. However, this arguably renders the questionnaire more vulnerable to response tendencies, like acquiescence bias. Of course, the absence of a (virtual) gold standard for assessing the level of personality functioning remains a limitation that plagues all research in this domain. For future research, we recommend comparing the psychometric performance of the present short LPFS-BF 2.0 to more full assessment measures of the LPFS (e.g. the LPFS-SR).[8] Also, future research could assess the sensitivity and specificity of the LPFS-BF 2.0 for distinguishing patients with and without a PD in a more heterogenous sample. Taken together, we suggest that this study demonstrates the potential value of the LPFS-BF 2.0 as a brief instrument that may also serve to assess individual change in personality functioning during treatment as a complement to assessing symptom reduction.

Acknowledgements

We would like to thank Carlijn Wibbelink of the University of Amsterdam for her help with conducting the confirmatory factor analyses in MPLUS.

References

1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*, 5th Edition. Arlington, VA: American Psychiatric Association, 2013.
2. 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**: 347–53.
3. Hutsebaut J, Kamphuis JH, Feenstra DJ, Weekers LC, de Saeger H. Assessing DSM-5 oriented level of personality functioning: development and psychometric evaluation of the Semi-structured Interview for Personality Functioning DSM-5 (STiP 5.1). *Personal Disord* 2016; **8**: 94–101.

DOI: 10.1002/pmh

4. Hopwood CJ, Malone JC, Ansell EB, Sanislow CA, Grilo CM, McGlashan TH et al. Personality assessment in DSM–5: empirical support for rating severity, style, and traits. *J Pers Disord* 2011; **25**: 305–20.
5. Morey LC, Benson KT, Busch AJ, Skodol AE. Personality disorders in DSM–5: emerging research on the alternative model. *Curr Psychiatry Rep* 2015; **17**: 1–9.
6. Tyrer P. The problem of severity in the classification of personality disorder. *J Pers Disord* 2005; **19**: 309–14.
7. Hopwood CJ. A framework for treating DSM-5 alternative model for personality disorder features. *Personal Ment Health* 2018; **12**: 107–25.
8. Morey LC. Development and initial evaluation of a self-report form of the DSM-5 Level of Personality Functioning Scale. *Psychol Assess* 2017; **29**: 1302–8.
9. Zimmermann J, Böhnke JR, Eschstruth R, Mathews A, Wenzel K, Leising D. The latent structure of personality functioning: investigating criterion a from the alternative model for personality disorders in DSM–5. *J Abnorm Psychol* 2015; **124**: 532–48.
10. Berghuis H, Kamphuis JH, Verheul R, Larstone R, Livesley J. The general assessment of personality disorder (GAPD) as an instrument for assessing the core features of personality disorders. *Clin Psychol Psychother* 2013; **20**: 544–57.
11. Bastiaansen L, De Fruyt F, Rossi G, Schotte C, Hofmans J. Personality disorder dysfunction versus traits: structural and conceptual issues. *Personal Disord* 2013; **4**: 293–303.
12. Verheul R, Andrea H, Berghout C, Dolan CC, Busschbach JJV, Van der Kroft PJA et al. Severity Indices of Personality Problems (SIPP-118): development, factor structure, reliability, and validity. *Psychol Assess* 2008; **20**: 23–34.
13. 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**: 1879–89.
14. Thylstrup B, Simonsen S, Nemery C, Simonsen E, Fjernestad Noll J, Myatt MW et al. Assessment of personality-related levels of functioning: a pilot study of clinical assessment of the DSM-5 level of personality functioning based on a semi-structured interview. *BMC Psychiatry* 2016; **16**: 298–306.
15. 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**: 1057–69.
16. Zimmermann J, Benecke C, Bender DS, Skodol AE, Schauenburg H, Cierpka M et al. Assessing *DSM–5* level of personality functioning from videotaped clinical interviews: a pilot study with untrained and clinically inexperienced students. *J Pers Assess* 2014; **96**: 397–409.
17. Garcia DJ, Skadberg RM, Schmidt M, Bierma S, Shorter RL, Waugh MH. It's not that difficult: an interrater reliability study of the *DSM–5* section III alternative model for personality disorders. *J Pers Assess* 2018: 1–9.
18. Dereboy F, Dereboy C, Eskin M. Validation of the *DSM–5* alternative model personality disorder diagnoses in Turkey, part 1: LEAD validity and reliability of the personality functioning ratings. *J Pers Assess* 2018: 1–9.
19. Huprich SK, Nelson SM, Meehan KB, Siefert CJ, Haggerty G, Sexton J et al. Introduction of the DSM-5 Levels of Personality Functioning Questionnaire. *Personal Disord: Theory Res Treat* 2017.
20. Hopwood CJ, Good EW, Morey LC. Validity of the DSM-5 levels of personality functioning scale-self report. *J Pers Assess* 2018: 1–10.
21. Hutsebaut J, Feenstra DJ, Kamphuis JH. Development and preliminarypsychometric evaluation of a brief self-report questionnaire for the assessment of the DSM-5 level of personality functioning scale: the LPFS Brief Form (LPFS-BF). *Personal Disord* 2016; **7**: 192–7.
22. Lambert M. Presidential address: what we have learned from a decade of research aimed at improving psychotherapy outcome in routine care. *Psychother Res* 2007; **17**: 1–14.
23. Lambert MJ, Harmon C, Slade K, Whipple JL, Hawkins EJ. Providing feedback to psychotherapists on their patients' progress: clinical results and practice suggestions. *J Clin Psychol* 2005; **61**: 165–74.
24. Buwalda VJA, Nugter MA, Swinkels JA, Mulder CL. Praktijkboek ROM in de ggz. Een leidraad voor gebruik en implementatie van meetinstrumenten, 2011. https://www.tijdstroom.nl/boek/praktijkboek-rom-in-de-ggz#.WYhl0P6wdHh
25. Nugter MA, & Buwalda VJA. Achtergronden en gebruiksmogelijkheden van ROM in de ggz. *Tijdschr Psychiatr* 2012; **54**: 111–20.
26. Mulder CL, & Kortrijk HE. De invloed van de duur van behandeling op het interpreteren van ROM-metingen bij ACT. *Tijdschr Psychiatr* 2012; **54**: 191–6.
27. Van Os J, Kahn R, Denys D, Schoevers RA, Beekman ATF, Hoogendijk WJG et al. ROM: gedragsnorm of dwangmaatregel? *Tijdschr Psychiatr* 2012; **54**: 245–53.
28. Derogatis LR. *Brief Symptom Inventory*. Clinical Psychometric Research: Baltimore, MD, 1975.
29. Berne E. Principles of transactional analysis. *Indian J Psychiatry* 1996; **38**: 154–9.
30. First MB, Spitzer RL, Gibbon M, Williams JBW. *Structured Clinical Interview for DSM-IV Axis I Disorders*. Washington, DC: American Psychiatric Press, 1997.
31. Groenestijn MAC, Akerhuis GW, Kupka RW, Schneider N, Nolen WA. *Gestructureerd klinisch interview voor de vaststelling van DSM-IV As-I stoornissen*. Lisse, The Netherlands: Swets test publishers, 1999.

DOI: 10.1002/pmh

32. Ventura J, Liberman RP, Green MF, Shaner A, Mintz J. Training and quality assurance with the Structured Clinical Interview for DSM-IV (SCID-I/P). *Psychiatry Res* 1998; **79**: 163–73.
33. First MB, Spitzer RL, Gibbon M, Williams JBW, Benjamin L. *Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II)*. Washington, DC: American Psychiatric Press, 1996.
34. Weertman A, Arntz A, Kerkhofs M. *Gestructureerd klinisch interview voor DSM-IV as II persoonlijkheidsstoornissen [Structured Clinical Interview for DSM-IV Axis II Personality Disorders]*. Amsterdam, The Netherlands: Harcourt Test Publishers, 1996.
35. Verheul R, Bartak A, Widiger T. Prevalence and construct validity of personality disorder not otherwise specified (PDNOS). *J Pers Disord* 2007; **21**: 359–70.
36. Maffei C, Fossati A, Agostoni I, Barraco A, Bagnato M, Deborah D et al. Interrator reliability and internal consistency of the structured clinical interview for DSM-IV Axis II personality disorders (SCID-II), version 2.0. *J Pers Disord* 1997; **11**: 279–84.
37. Weertman A, Arntz A, Dreessen L, van Velzen C, Vertommen S. Short-interval test-retest interrater reliability of the Dutch version of the Structured Clinical Interview for DSM–IV Personality Disorders (SCID-II). *J Pers Disord* 2003; **17**: 562–7.
38. Lobbestael J, Leurgans M, Arntz A. Inter-rater reliability of the structured clinical interview for DSM-IV Axis I disorders and Axis II disorders. *Clinical Psychology and Psychotherapy* 2011; **18**: 75–79.
39. De Beurs E. Brief Symptom Inventory 18 (BSI): Handleiding. In: *Leiden: PITS*, 2006.
40. Feenstra DJ, Hutsebaut J, Verheul R, Busschbach JJV. Severity indices of personality problems (SIPP-118) in adolescents: reliability and validity. *Psychol Assess* 2011; **23**: 646–55.
41. Muthén LK. *Muthén BO. MPLUS user's guide*, 6th Edition. Los Angeles: Author, 2010.
42. Brown TA. *Confirmatory Factor Analysis for Applied Research*. New York: Guilford Press, 2014.
43. Little TD. *Longitudinal Structural Equation Modeling*. New York: Guilford Press, 2013.
44. Sharp C, Wright AGC, Fowler JC, Frueh BC, Allen JG, Oldham J et al. The structure of personality pathology: both general ('g') and specific ('s') factors? *J Abnorm Psychol* 2015; **124**: 387–98.
45. Bender DS, & Skodol AE. Borderline personality as a self-other representational disturbance. *J Pers Disord* 2007; **21**: 500–17.
46. Deyo RA, Diehr P, Patrick DL. Reproducibility and responsiveness of health status measures statistics and strategies for evaluation. *Control Clin Trials* 1990; **12**: 142S–158S.
47. Kazis LE, Anderson JJ, Meenan RF. Effect sizes for interpreting changes in health status. *Med Care* 1989; **27**: S178–S189.
48. Liang MH, Fossel AH, Larson MG. Comparisons of five health status instruments for orthopedic evaluation. *Med Care* 1990; **28**: 632–42.
49. Guyatt G, Walter S, Norman G. Measuring change over time: assessing the usefulness of evaluative instruments. *J Chronic Diseases* 1987; **40**: 171–8.
50. Berghuis H, Kamphuis JH, Verheul R. Core features of personality disorder: differentiating general personality dysfunction from personality traits. *J Pers Disord* 2012; **26**: 704–16.

Address correspondence to: Laura Weekers, De Viersprong, De Beeklaan 2, 4661 EP Halsteren, The Netherlands. Email: laura.weekers@deviersprong.nl

DOI: 10.1002/pmh