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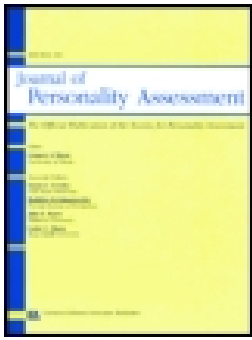
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## Level of Personality Functioning Scale–Brief Form 2.0: Utility in Capturing Personality Problems in Psychiatric Outpatients and Incarcerated Addicts

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### ABSTRACT

This study examined the utility of the Level of Personality Functioning Scale–Brief Form 2.0 (LPFS–BF 2.0) in measuring features corresponding to self–other impairment of personality functioning as defined in the new general diagnostic guidelines for Personality Disorder in DSM-5 Section III and ICD-11. A mixed clinical sample ( $N = 228$ ) composed of 121 psychiatric outpatients and 107 incarcerated addicts was administered the LPFS–BF 2.0, World Health Organization Wellbeing Index (WHO–5), Symptom Checklist–90–Revised (SCL–90–R), Personality Inventory for DSM–5 (PID–5), and the Schema Mode Inventory (SMI). The LPFS–BF 2.0 yielded two latent components that correspond to an interpretation of self- and interpersonal functioning, and showed relevant associations with severity indexes, well-being, dysfunctional schema modes, and lack of healthy functioning modes. The LPFS–BF 2.0 also demonstrated incremental prediction of reduced healthy adult functioning, fulfillment, and well-being over and above the total PID–5 trait score, although this did not apply to dysregulated anger and overcompensatory coping. Taken together, the LPFS–BF 2.0 is a psychometrically satisfactory instrument that generally captures theoretically expected self–other features of personality dysfunctioning, in particular lack of healthy functioning and fulfillment but to a lesser degree overcompensatory and antagonistic features. Findings warrant replication in different clinical and forensic populations.

### ARTICLE HISTORY

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The Alternative Model for Personality Disorders (AMPD), introduced in Section III of the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed. [DSM–5]; American Psychiatric Association, 2013; Morey et al., 2011) as well as the International Classification of Diseases (11th ed. [ICD–11]; World Health Organisation, 2018) diagnostic guidelines for Personality Disorder have introduced a radically different operationalization of personality pathology. Whereas the traditional definition of personality disorders (PDs) refers to patterns of inner experience and behavior manifesting themselves in symptoms like recurrent suicidal behavior or intense and instable relationships, this new approach defines PDs in terms of level of personality functioning (LPF) related to such symptoms along with trait qualifiers organized in five domains. The measurement of features corresponding to the LPF is the focus of this study, and these features are essentially the same as the level of disturbance in personality functioning presented in the ICD–11 diagnostic guidelines for Personality Disorder. The LPF assumes that the core of personality pathology lies in the (lack of) capacity to regulate a range of emotional experience rather than just intense emotions. Likewise, impaired interpersonal functioning is reflected in the (lack of) capacity for durable connections rather than intense and instable relationships. To define these core impairments in LPF, Bender, Morey, and Skodol (2011) relied on psychodynamically informed literature focusing on self- or interpersonal functioning, including Kernberg's model of personality organization

(Kernberg, 1970), Blatt's theory of personality development (Luyten & Blatt, 2011), and theories of mentalization and social cognition (Fonagy & Bateman, 2008), among others. Moreover, there is also extensive literature demonstrating that PDs are associated with distorted thinking about self and others. For example, individuals with avoidant PD use early maladaptive schemas centering on a self that is defective and shame-ridden while expecting to be abandoned by others because of own shortcomings (Jovev & Jackson, 2004; Young, Klosko, & Weishaar, 2003). Such distinction between self and others assumes that core impairments of personality pathology—although shaping one generalized dimension of severity—comprise impairments in self-functioning (including identity and self-direction) and interpersonal functioning (including empathy and intimacy). Healthy personality functioning assumes the development of self-capacities and of interpersonal capacities, and deviations of this healthy development can be represented by different degrees of personality pathology. Essentially, LPF was designed to address overall personality functioning, and can be used independent of making any categorical diagnostic assignment.

### Measuring level of personality functioning

To provide an assessment tool for representing these deviations, the AMPD introduced the Level of Personality

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 Supplemental data for this article can be accessed on the publisher's website.

Functioning Scale (LPFS), which offers markers of severity for each facet or impairment at each level of personality functioning (American Psychiatric Association, 2013). This provides professionals with a tool to assess severity of personality dysfunction, which could be operationalized using the Structured Clinical Interview for DSM–5–Alternative Model of Personality Disorders (SCID–AMPD) Module I (Bender, Skodol, First, & Oldham, 2018) or the Semi-Structured Interview for Personality Functioning (STIP 5.1; Hutsebaut, Kamphuis, Feenstra, Weekers, & De Saeger, 2017).

Whereas *DSM–5* explicitly refers to the Personality Inventory for DSM–5 (PID–5) to assess personality traits (Criterion B), no such self-report instrument has been developed for assessing the LPF at the time of its publication. At this moment several self-report instruments have been published to assess personality functioning, including the 80-item Level of Personality Functioning Scale–Self-Report (LPFS–SR; Morey, 2017), the 132-item DSM–5 Levels of Personality Functioning Questionnaire (DLOPFQ; Huprich et al., 2017), and the 97-item Level of Personality Functioning Questionnaire for adolescents (LOPF–Q 12–18; Goth et al., 2017). Additionally, the *DSM–5* Section III Disorder Specific Impairment Measures have been developed for the six disorder types described in the AMPD including 7 to 14 items per disorder, which are self-rated on a 5-point scale (Anderson & Sellbom, 2018; Liggett, Carmichael, Smith, & Sellbom, 2017).

Hutsebaut, Feenstra, and Kamphuis (2016) took another approach to measure the general LPF with a very compact and focused set of items, which particularly limits the burden on those who are completing the form. Instead of listing all severity markers exhaustively, they chose to formulate one item for each of the 12 LPFS facets, aiming to capture the core impairment of the particular facet. In terms of face validity, these items also cover the ICD-11 diagnostic requirements for self- and interpersonal dysfunction. The instrument includes six items for self- and interpersonal functioning, respectively, and three items for each facet within the four LPFS subdomains (identity, self-direction, empathy, and intimacy), and thus making a total of 12 items. For example, instead of designing items according to each level of unique sense of self (first facet of identity), Hutsebaut et al. (2016) simply formulated one item that was thought to capture the basic underlying impairment; for example, “I often do not know who I really am.” The initial Level of Personality Functioning Scale–Brief Form (LPFS–BF) therefore consists of only 12 items, with a simple yes–no response format, primarily aimed to screen quickly for possible impairments in personality functioning (Hutsebaut et al., 2016). Preliminary results demonstrated a clear two-factor structure, corresponding to the self–other factors as presupposed by the LPFS model. Both subscales demonstrated acceptable to good reliability and the total scale showed construct validity as a measure of personality pathology. An updated LPFS–BF 2.0 was recently developed, meeting some shortcomings of the original list and including a Likert response scale (Weekers, Hutsebaut, & Kamphuis, 2017). Now, demonstration of its validity and coverage of LPFS constructs is important, including in a language other than the original Dutch version and in a population other than just help-seeking outpatients.

## Level of personality functioning versus stylistic traits

Essentially, LPFS was constructed to capture the generic impairments underlying all types of PDs. The assumption behind this approach is that all PDs share some essential commonalities that as a whole distinguish PDs from other mental conditions, no matter how diverse their stylistic appearances are (Morey et al., 2011). Regardless of how different people with avoidant PD and narcissistic PD might be in external appearance, experienced burden of disease, and symptom profile, they are supposed to share a range of impairments in personality processes (e.g., self-appraisal might be unnuanced in terms of self-loathing or self-aggrandizing). Accordingly, Criterion A (functioning) of the AMPD is used to establish “whether” and “to which degree” the patient is personality disordered, whereas the separate Criterion B (traits) is used to delineate “the flavor” or unique stylistic features of the disorder. However, some studies suggest that the level of functioning provides relatively redundant information that could be obtained by assessment of traits.<sup>1</sup> For example, Few et al. (2013) found that LPFS impairment ratings did not account for incremental variance in any of the *DSM–IV* PDs beyond the *DSM–5* traits proposed for each PD type. Clark and Ro (2014), Hentschel and Pukrop (2014), and Calabrese and Simms (2014) found traits and functioning to show large cross-sectional overlap with one another. Likewise, Zimmermann et al. (2015) identified a blurry pattern of covariation across level of functioning and traits when looking at the latent structure. More specifically, using a sample of female inmates, Sleep, Wygant, and Miller (2017) found that level of impairment contributed to the prediction of borderline PD, narcissistic PD, and interpersonal-affective features of psychopathy, but did not add to the prediction of antisocial PD and impulsive-antisocial features of psychopathy. Yet, these results conflict with research suggesting that general PD severity provides additional information about *DSM–IV* PDs above and beyond PID–5 traits (Hopwood, Thomas, Markon, Wright, & Krueger, 2012). Moreover, Calabrese and Simms (2014) showed that baseline general impairment ratings predicted future functional impairment beyond pathological trait ratings, suggesting that functioning does reflect features beyond that which can be captured by personality traits alone. Because these conceptual distinctions between functioning and traits continue to be blurred, more work needs to be done to test the psychometric distinctiveness of these constructs (i.e., incremental validity).

## The goal of this study

The overall goal of this study was to evaluate the utility of the LPFS–BF 2.0 in capturing external correlates of personality-related functioning using a mixed sample of psychiatric outpatients and incarcerated addicts. First, we aimed to replicate the self–other structure of the LPFS–BF 2.0 to establish its

<sup>1</sup>Various studies have used different measures of the LPFS or related constructs; accordingly, measures of LPFS or functioning and impairment should not be equated with the LPFS per se.

structural validity. Next, we investigated associations of LPFS–BF 2.0 scales with relevant measures of personality dysfunction and severity in terms of the World Health Organization (WHO) WHO–5 Wellbeing Index, Symptom Checklist–90–Revised (SCL–90–R) derived PD Severity Index, and PID–5 total score (proxy for severity). To examine convergence with clinically derived constructs of personality functioning, we also employed the Schema Mode Inventory (SMI) as a measure of dysfunctional and healthy schema modes according to the schema mode model, which was originally developed by Young and First (2003) with the purpose of conceptualizing severe and fluctuating PD psychopathology (see further details in the description of measures). Finally, to test the distinctive features captured by LPFS relative to traits, we explored whether the LPFS–BF 2.0 contributes to the prediction of personality-related functioning correlates in terms of incremental validity over and above the total PID–5 trait score.

## Method

### Participants and procedures

All participants ( $N = 228$ ) were consecutively recruited from a psychiatric outpatient clinic and a prison treatment unit. Socio-demographics and distribution of age and gender are presented in Table 1, and clinical characteristics and descriptive statistics are presented in Table 2 and Table S1.

Psychiatric outpatients ( $n = 121$ ) were recruited from a psychiatric hospital unit specialized in assessment and treatment of PDs and emotional disorders. Each patient was initially evaluated by a psychologist or psychiatrist, and met the diagnostic criteria for at least one mental disorder, including particularly high prevalences of borderline PD and avoidant PD along with cooccurring anxiety disorders, depressive disorders, and eating disorders.<sup>2</sup> Patients suspected of having a current organic disorder, psychotic disorder, substance-related disorder, severe depression, autism spectrum disorder, or manic episode were not included.

Male incarcerated addicts ( $n = 107$ ) were recruited from a prison unit specialized in treatment of cooccurring personality pathology and substance abuse. In addition to elevated antagonistic personality pathology (see Table 2), the prisoners also reported having used the following substances within the last year: opioids including heroin (17.8%), central nervous system stimulants including cocaine and amphetamine (58.9%), cannabis including skunk and pot (62.6%), benzodiazepenes including valium (27.1%), hallucinogens including LSD and mescaline (13.1%), excessive alcohol use (49.5%), and other substances (15.9%).

As an initial routine part of their assessment and treatment, each participant was administered a battery of computerized self-report inventories including the LPFS–BF 2.0 and the remaining measures employed in this study. As a natural part of their introductory psychoeducational program, all participants received individual feedback on their test scores. Participants gave their consent

to have their data used for research purposes, and the study was approved by a local scientific ethics committee.

## Measures

### Level of Personality Functioning Scale–Brief Form 2.0

The LPFS–BF 2.0 served as the target of this study. The LPFS–BF 2.0 is a 12-item self-report measure of features corresponding to the LPFS (Weekers et al., 2017). The respondent is requested to rate each item on a 4-point Likert-scale (0 = *very false or often false*; 1 = *sometimes or somewhat false*; 2 = *sometimes or somewhat true*; 3 = *very true or often true*). Each item is intended to capture the basic underlying impairment related to the 12 features of functioning indicated in the LPFS. For example, the three specific features related to intimacy are captured by Item 10 (“My relationships and friendships never last long”), Item 11 (“I often feel very vulnerable when relations become more personal”), and Item 12 (“I often do not succeed in cooperating with others in a mutually satisfactory way”).

The LPFS–BF was initially constructed and empirically evaluated in Dutch, and subsequently translated to English (Hutsebaut et al., 2016). The Danish translation of the updated LPFS–BF 2.0 was carried out according to international guidelines (Hambleton, 2001). First, the LPFS–BF 2.0 items were consensus-translated from the English version to Danish by a team of two psychologists and one psychiatrist, all with expertise in PDs (Bach, Simonsen, & Simonsen, 2016). Subsequently, the items were back-translated into Dutch by a blinded psychologist fluent in both Dutch and Danish, and eventually, the back-translation of LPFS–BF 2.0 was approved by its author. Cronbach’s alpha coefficients were .89 for the LPFS–BF total scale, .86 for the self-functioning subscale, and .80 for the interpersonal functioning subscale. All corrected item–total correlations were above .45.

### World Health Organization 5 Wellbeing Index

The WHO–5 is a self-report measure of subjective psychological well-being, which is expected to capture how mental problems impair well-being and quality of life. The tool mirrors the positive tone of WHO by describing psychological health instead of mental distress (Bech, 2012; Topp, Østergaard, Søndergaard, & Bech, 2015). Importantly, research suggests that well-being emerges as a core component of personality functioning (Ro & Clark, 2009), which makes this measure particularly relevant for this study. The measure comprises five simple items, which tap into the subjective well-being of the respondents. In this study, we scored the WHO–5 according to the official scoring key: Each of the five items is rated on a 6-point Likert scale ranging from 0 (*not present*) to 5 (*constantly present*). The raw score ranges from 0 to 25 and is transformed into a scale from 0 (*worst thinkable well-being*) to 100 (*best thinkable well-being*) by multiplying by 4. Thus, a higher score reveals better well-being. The alpha coefficient for the WHO–5 scale in this study was .87.

### Symptom Checklist–90–Revised

The SCL–90–R (Derogatis, 1992) was employed in this study to estimate global symptom severity and in particular a calculated index of PD severity. The SCL–90–R is a 90-item inventory designed to measure a variety of symptom distress. The

<sup>2</sup>We did not record detailed diagnostic characteristics for all participants in this study. Instead we refer to detailed diagnostic characteristics for consecutively admitted patients in this particular clinical setting, which are reported elsewhere (Bach & Fjeldsted, 2017). Additionally, we refer to the self-reported characteristics in Table 2 and Table S1.



**Table 1.** Sociodemographic characteristics for total sample and subsamples.

	Outpatients ( <i>n</i> = 121; 21% males)		Inmates ( <i>n</i> = 107; 100% males)		Total ( <i>N</i> = 228; 58% males)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Age						
<i>M</i>	30.04		33.15		31.50	
<i>SD</i>	9.53		10.37		10.03	
In a relationship	79	65.3%	53	49.5%	132	57.9%
Single	42	34.7%	54	50.5%	96	42.1%
Employment status						
Unemployed	62	51.2%	77	72.0%	139	61.0%
Long-term sick leave	32	26.4%	9	8.4%	41	18.0%
Disability pension	1	0.8%	11	10.3%	12	5.3%
In public health care rehabilitation	8	6.6%	2	1.9%	10	4.4%
Ordinary employment <sup>a</sup>	50	41.3%	1	15.9%	67	29.4%
Educational background						
Below high school	34	28.1%	71	66.4%	105	46.1%
Vocational school	19	15.7%	27	25.2%	46	20.2%
High school	36	29.8%	2	1.9%	38	16.7%
Bachelor's level	26	21.5%	6	5.6%	32	14.0%
Above bachelor's level	6	5.0%	1	0.9%	7	3.1%

<sup>a</sup>Includes students, employees, and self-employed.

respondent rates each item on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). First, the global distress index was estimated by averaging scores on all items. Next, the Personality Severity Index (PSI) was estimated by averaging the SCL-90-R scores for interpersonal sensitivity, hostility, and paranoid ideation. The PSI is an empirically derived severity index of subjective distress in patients with PDs (Karterud et al., 1995). The PSI measure should be minimally confounded by cooccurring anxiety and mood disorders, and it has demonstrated stability over time (Karterud et al., 1995). The psychometric features of the Danish version of all SCL-90-R scales have been empirically supported (Olsen, Mortensen, & Bech, 2004). The global SCL-90-R general severity index showed an alpha coefficient of .98, and each subscale yielded an alpha of at least .80. The PSI scale (composed of items from hostility, interpersonal sensitivity, and paranoid ideation) showed an alpha coefficient of .93.

#### Personality inventory for DSM-5 short form

The PID-5 Short Form (PID-5 SF) was used to characterize participants in terms of pathological trait domains and indicate

the global severity of personality pathology by means of total score. The PID-5 SF is an abbreviated 100-item version (Maples et al., 2015) of the original 220-item PID-5 form (Krueger, Derringer, Markon, Watson, & Skodol, 2012). The content of the PID-5 items and the 25 generated trait facets is derived from recognized PD features including the 10 preserved *DSM-IV* PD types as well as empirically based trait models of personality pathology (Krueger et al., 2012). Accordingly, in this study we employed the total composite score of PID-5 as a proxy for PD severity, which is consistent with research supporting that severity might be reflected in a total composite score for polythetic diagnostic PD criteria (Crawford, Koldobsky, Mulder, & Tyrer, 2011) as well as PD traits criteria (Samuel, Hopwood, Krueger, Thomas, & Ruggero, 2013). The reliability and validity of the Danish version of the PID-5 SF has been empirically established (Bach, Maples-Keller, Bo, & Simonsen, 2016). Alpha coefficients for PID-5 facets in this study were all above .70, except for irresponsibility (.60), which nevertheless showed corrected item-total correlations above .30 for each of the four items. The total PID-5 composite scale (proxy for severity) had an alpha of .97.

**Table 2.** Clinical characteristics and descriptive statistics for the total sample and subsamples.

	Total		Outpatients		Inmates		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
LPFS-BF 2.0 total	1.35	0.73	1.63	0.69	1.03	0.65	0.89**
LPFS-BF 2.0 self	1.45	0.88	1.84	0.80	1.01	0.75	1.07**
LPFS-BF 2.0 interpersonal	1.23	0.72	1.38	0.74	1.06	0.67	0.45**
SCL-90-R general symptom severity	1.21	0.71	1.47	0.70	0.91	0.60	0.86**
SCL-90-R Personality Severity Index	1.19	0.79	1.43	0.81	0.92	0.67	0.68**
WHO-5 Wellbeing Index	41.93	22.98	35.21	19.39	49.53	24.39	-0.66*
PID-5-SF total mean score (proxy for severity)	1.01	0.48	1.06	0.49	0.94	0.46	0.25*
PID-5-SF Negative Affectivity	1.36	0.73	1.58	0.72	1.05	0.62	0.78**
PID-5-SF detachment	1.05	0.70	1.22	0.68	0.81	0.64	0.63**
PID-5-SF antagonism	0.66	0.61	0.54	0.59	0.83	0.60	-0.49**
PID-5-SF disinhibition	1.14	0.68	1.15	0.68	1.13	0.69	0.03
PID-5-SF psychoticism	0.74	0.61	0.79	0.62	0.67	0.59	0.20

Note. *N* = 228 total; *n* = 121 outpatients; *n* = 107 = prisoners. LPFS-BF 2.0 = Level of Personality Functioning Scale-Brief Form 2.0; SCL-90-R = Symptom Checklist-90-Revised; PID-5-SF = Personality Inventory for DSM-5 Short Form.

\**p* = .05 level.

\*\**p* = .001.

### Schema Mode Inventory

The SMI is a 118-item inventory measuring 14 modes according to the schema mode model of severe personality pathology. This model was originally developed by Young and First (2003), and subsequently operationalized by Lobbestael, van Vreeswijk, Spinhoven, Schouten, and Arntz (2010) as a measure of 14 distinct modes. Each SMI item is rated on a 6-point Likert-type scale ranging from 1 (*never or almost never*) to 6 (*always*). In traditional cognitive models, PDs are considered to be schematically based, whereas the theory of modes has been put forward to further elucidate severe and fluctuating psychopathology of PDs including affective instability and dissociation (Beck, 1996; Young et al., 2003). The concept of schema modes is particularly rooted in object relations theory, transactional analysis, and ego-state therapy, where child modes correspond to child self-states, parent modes correspond to parent self-states, and healthy adult mode corresponds to an adult self-state (Arntz & Jacob, 2012; Watkins, 1978). Accordingly, dysfunctional child modes include emotionally immature and dysregulated features of personality functioning; parent modes might include personal standards that are unreasonably high or critical and compromise authenticity. The remaining modes comprise various strategies for coping with the vulnerability of the inner child including the toxic “messages” from the internalized punitive or demanding parent modes. Thus, modes are mainly sets of activated maladaptive schemas (i.e., object relations, internal working models, or affective schemas) along with dysfunctional coping responses (i.e., detached protector, compliant surrenderer, and bully and attack), and include momentary regressions to child-like affective-behavioral responses triggered by current emotionally threatening events (i.e., vulnerable, angry, impulsive, and enraged child modes). A mode might also reflect an internalized demanding or punitive authority or parent in terms of self-criticism or self-punishment (i.e., punitive or demanding parent mode). Finally, the model also describes functional modes reflecting psychological health, curiosity, and fulfillment of one’s own emotional needs (i.e., healthy adult and happy child modes).

Research indicates that the SMI scales differentially capture features of PDs (Bach, Lee, Mortensen, & Simonsen, 2016; Bamelis, Renner, Heidkamp, & Arntz, 2011) including borderline-related dissociation (Johnston, Dorahy, Courtney, Bayles, & O’Kane, 2009), criminal or violent behavior (Keulen-de Vos et al., 2016), and levels of personality organization according to Kernberg’s psychodynamic theory (Eurelings-Bontekoe, Luyten, Ijssennagger, van Vreeswijk, & Koelen, 2010). The psychometric qualities of the Danish translation of SMI have been supported, except for the scale of detached self-soother mode, which did not emerge as a distinct factor (Reiss, Krampen, Christoffersen, & Bach, 2016); accordingly, we omitted this scale from this study. Alpha coefficients for the 13 SMI scales in this study were all above .80.

## Results

### Descriptive statistics

As displayed in Table 2, outpatients showed a higher mean score on LPFS–BF 2.0 self-functioning relative to interpersonal functioning, whereas incarcerated addicts showed a slightly

higher mean score on interpersonal functioning relative to self-functioning. In general, outpatients showed a significantly higher LPFS–BF 2.0 score relative to prisoners.

Moreover, as evident from Table 2 and Table S1, the outpatients showed substantially higher PID–5 scores on negative affectivity in terms of submissiveness, anxiousness, emotional lability, and depressivity relative to the prisoners. On the other hand, the prisoners showed significantly higher PID–5 scores on antagonism (i.e., deceitfulness, manipulativeness, callousness, and grandiosity) along with facets of risk taking (from disinhibition) and restricted affectivity (from detachment) in comparison to the outpatients.

### Replication of self–other structure

First, we sought to determine whether a two-factor LPFS–BF 2.0 structure corresponds to the most appropriate number of latent domains using principal axis factoring analysis with promax rotation. Accordingly, we found that a two-factor structure was consistently supported by three different statistical indicators. As presented in Table S2, we initially used the eigenvalue higher than 1 criterion, which suggested retaining two factors (Kaiser, 1991). Next, we employed parallel analysis based on 1,000 random permutations of the original data (Horn, 1965). As shown in Table S2, the second observed eigenvalue was the last that was higher than would be expected from randomly generated data sets with the same parameters as the original data set, which therefore indicated a two-factor model to be most appropriate. Finally, we performed a scree-plot analysis (see Figure S1) showing that the last substantial drop on the scree plot occurred before the third component, suggesting that a two-factor structure is most sound (Cattell, 1966).

Next, we explored the pattern of loadings to determine whether the hypothesized self–other structure is sufficiently replicated. As presented in Table 3, the LPFS–BF 2.0 items yielded a two-factor loading pattern, which largely corresponded to an interpretation of the LPFS domains of self- and interpersonal functioning. We used a loading of .40 to determine if a factor score was interpretable on a particular item (Matsunaga, 2011). However, for the total combined sample, Item 10 did not show loadings above .40 on any of the components, and Item 11 primarily loaded on self-functioning instead of interpersonal functioning. For the prison sample, Item 4 did not load on self-functioning as expected and Item 11 loaded most strongly on self-functioning instead of interpersonal functioning. For the outpatient sample, all items showed expected loadings above .40 on expected components. However, Item 3 showed loadings above .40 for both self- and interpersonal functioning. Finally, we estimated Tucker’s congruence coefficients across the two subsamples (Lorenzo-Seva & ten Berge, 2006), which showed fair structural similarity for LPFS–BF 2.0 self-functioning (.91) and interpersonal functioning (.93). In addition, we also estimated congruence coefficients across the total sample and the Dutch construction sample (Weekers et al., 2017), which yielded good similarity for self-functioning (.95) and interpersonal functioning (.93). The self–other inter-factor correlations were .64 (total sample), .69 (outpatients), and .66 (prisoners). Likewise, the intersubscale correlations were .60 (total sample), .65 (outpatients), and .64 (prisoners).

**Table 3.** Principal axis factoring analysis with promax rotation of Level of Personality Functioning Scale–Brief Form 2.0 items.

	Outpatients		Inmates		Total	
	Self	Interpersonal	Self	Interpersonal	Self	Interpersonal
1. I often do not know who I really am	<b>0.76</b>	−0.03	<b>0.62</b>	−0.02	<b>0.72</b>	−0.02
2. I often think very negatively about myself	<b>0.85</b>	−0.12	<b>0.89</b>	−0.16	<b>0.98</b>	−0.23
3. My emotions change without me having a grip on them	<b>0.44</b>	0.43	<b>0.44</b>	0.31	<b>0.63</b>	0.22
4. I have no sense of where I want to go in my life	<b>0.69</b>	−0.02	0.17	<b>0.39</b>	<b>0.51</b>	0.15
5. I often do not understand my own thoughts and feelings	<b>0.53</b>	0.26	<b>0.47</b>	0.38	<b>0.59</b>	0.26
6. I often make unrealistic demands on myself	<b>0.65</b>	−0.15	<b>0.64</b>	−0.05	<b>0.72</b>	−0.13
7. I often have difficulty understanding the thoughts and feelings of others	−0.05	<b>0.74</b>	−0.06	<b>0.68</b>	−0.12	<b>0.78</b>
8. I often find it hard to stand it when others have a different opinion	−0.16	<b>0.67</b>	0.16	<b>0.36</b>	0.14	<b>0.41</b>
9. I often do not fully understand why my behavior has a certain effect on others	−0.20	<b>0.85</b>	−0.23	<b>0.88</b>	−0.16	<b>0.84</b>
10. My relationships and friendships never last long	0.30	<b>0.40</b>	0.19	<b>0.29</b>	<b>0.36</b>	0.30
11. I often feel very vulnerable when relations become more personal	0.17	<b>0.51</b>	<b>0.45</b>	0.30	<b>0.48</b>	0.27
12. I often do not succeed in cooperating with others in a mutually satisfactory way	0.22	<b>0.58</b>	0.14	<b>0.57</b>	0.25	<b>0.54</b>

Note.  $N = 228$ . The strongest loading coefficient for each item is shown in bold.

### Association with external correlates

To explore the criterion validity of the LPFS–BF 2.0 total and subscales we investigated their associations with established measures of personality dysfunction, distress, and well-being. As presented in Table 4, the total LPFS–BF 2.0 score showed large ( $> .50$ ) correlations with the majority of criterion variables. To determine statistically significant differences between correlations for self- versus interpersonal functioning, we calculated Steiger's  $t$  test differences (Steiger, 1980). From this perspective, we found no significant differences for PID–5 total score<sup>3</sup> (proxy for severity), SCL–90–R PSI, and healthy adult mode. However, the self-functioning scale was predominantly associated with SCL–90–R global symptom distress, WHO–5 Wellbeing, vulnerable child mode, (lack of) happy child mode, internalized punitive parent mode, detached protector mode, and compliant surrenderer mode. The interpersonal functioning scale was predominantly associated with angry child mode, impulsive child mode, enraged child mode, bully and attack mode, and self-aggrandizer mode.

### Incremental validity

To examine the incremental prediction of LPFS–BF 2.0 functioning over PID–5 traits, we first ran a series of Pearson correlation analyses to determine the zero-order associations of LPFS–BF 2.0 and PID–5 total scores with the various external correlates (i.e., PSI, WHO–5 Wellbeing Index, and SMI modes), which are reported in Table 5. Generally speaking, all external constructs were at least moderately correlated with both the LPFS–BF 2.0 ( $r_s = .41$  [SMI bully and attack] to  $.84$  [PSI severity]) and the PID–5 total ( $r_s = .46$  [SMI compliant surrenderer] to  $.71$  [SMI angry child]).

Next, as shown in Table 5, we conducted a series of Steiger's  $t$  tests to determine if the magnitude of these correlations showed significant differences. The LPFS–BF 2.0 showed significantly stronger correlations for WHO–5 Wellbeing, SMI healthy adult, and SMI happy child, whereas PID–5 total showed significantly stronger correlations for SMI angry child, SMI enraged child, and SMI impulsive child, as well as SMI self-aggrandizer, and SMI bully and attack.

Subsequently, we examined the contributions of the LPFS–BF 2.0 and PID–5 total in predicting the theoretically expected external correlates by means of a series of hierarchical regressions. First, we regressed each external correlate onto the LPFS–BF 2.0 in the first step and the LPFS–BF 2.0 and PID–5 in the second step to determine to what extent the LPFS–BF 2.0 added predictive utility over and above the PID–5 total score. Additionally, we evaluated the contribution of the LPFS–BF 2.0 over and above the PID–5 total score by conducting hierarchical regression analyses in which PID–5 was entered into Step 1, and the PID–5 and LPFS–BF 2.0 were entered into Step 2. These analyses are presented in Table 5.

In every case, the LPFS–BF 2.0 score significantly predicted external correlates (accounting for between 14% and 56% of the variance) in the first step. In the majority of cases the PID–5 score significantly added to the prediction of external correlates over and above the LPFS–BF 2.0 score. When the opposite was examined, the PID–5 significantly predicted all external correlates in the first step (accounting for 21%–57% of the variance). In addition, the LPFS–BF 2.0 tended to significantly predict external correlates over and above the PID–5 in most cases. Taken together, the LPFS–BF 2.0 incrementally predicted WHO–5 Wellbeing, PSI, SMI healthy adult, SMI happy child, SMI compliant surrenderer, and SMI demanding parent over and above the PID–5 score. However, the PID–5 score incrementally predicted SMI vulnerable child, SMI angry child, SMI enraged child, SMI impulsive child, SMI undisciplined child, SMI detached protector, SMI self-aggrandizer, SMI bully and attack, and SMI punitive parent over and above LPFS–BF.

### Discussion

This study sought to investigate the self–other structure and criterion validity of the LPFS–BF 2.0 in a Danish population of psychiatric outpatients and incarcerated addicts. Findings generally confirmed the two-factor self–other structure as described in the DSM–5 Section III and the ICD–11, which was most convincing in the outpatient sample and more modest in the male prison sample. Thus, findings were overall consistent with the assumption taken by the DSM–5 Personality and Personality Disorder Work Group, the ICD–11 Working Group for the Revision of Personality Disorder as well as psychodynamic literature describing a dialectical interaction between self and interpersonal features (Bender et al., 2011; Luyten & Blatt, 2011). Accordingly, we found that the self- and interpersonal

<sup>3</sup>Correlations with PID–5 domains and facets are provided in Table S3.



**Table 4.** Correlation of LPFS-BF 2.0 scores with criterion variables.

	LPFS-BF 2.0 total functioning	LPFS-BF 2.0 self-functioning	LPFS-BF 2.0 interpersonal functioning	Steiger's test
PID-5-SF total mean score (proxy for severity)	0.79	0.69	0.74	1.44
WHO-5 Wellbeing Index	-0.57	<b>-0.58</b>	-0.43	3.26*
SCL-90-R Personality Severity Index	0.76	0.69	0.69	< 0.01
SMI healthy functioning modes				
Healthy adult	-0.64	-0.62	-0.50	0.40
Happy child	-0.73	<b>-0.70</b>	-0.58	2.49*
SMI dysfunctional inner child modes				
Vulnerable child	0.73	<b>0.73</b>	0.54	4.04*
Angry child	0.62	0.50	<b>0.64</b>	2.65*
Enraged child	0.44	0.29	<b>0.54</b>	4.29*
Impulsive child	0.58	0.43	<b>0.63</b>	3.71*
Undisciplined child	0.57	<b>0.57</b>	0.42	2.64*
SMI dysfunctional coping modes				
Compliant surrenderer	0.48	<b>0.50</b>	0.33	2.83*
Detached protector	0.70	<b>0.68</b>	0.56	2.42*
Self-aggrandizer	0.41	0.31	<b>0.45</b>	2.26*
Bully and attack	0.41	0.26	<b>0.51</b>	4.20*
SMI internalized parent modes				
Punitive parent	0.65	<b>0.65</b>	0.48	3.24*
Demanding parent	0.51	<b>0.54</b>	0.33	3.59*

Note.  $N = 228$ . LPFS-BF 2.0 = Level of Personality Functioning Scale-Brief Form 2.0; PID-5-SF = Personality Inventory for DSM-5 Short Form; SCL-90-R = Symptom Checklist-90-Revised; SMI = Schema Mode Inventory. Correlations for LPFS-BF 2.0 subscales that are significantly superior to one another are shown in bold. All bivariate correlations are significant at the .001 level.

\* $p = .05$ .

functioning factors were substantially correlated (close to .70), which is consistent with the AMPD conceptualization of general personality functioning. The LPFS-BF 2.0 total and subscale scores demonstrated some relevant associations with criterion variables. Essentially the LPFS-BF 2.0 total score was predominantly associated with estimated personality severity as well as vulnerable child mode and low happy child mode. Moreover, there was no significant difference between self- and interpersonal functioning in terms of their association with estimated severity of personality pathology and poor healthy

adult functioning, indicating that self and other features are equally important for such constructs. Finally, we found the LPFS-BF 2.0 to be specifically useful for capturing lack of psychological health and fulfillment over and above PID-5 traits. These findings are further discussed in what follows.

### Utility in outpatient versus prison populations

The clear factor structure resembled in the outpatient sample was not as clearly replicated in the prison sample, yet, the factor

**Table 5.** Incremental validity of LPFS-BF 2.0 versus PID-5 traits.

	$r$		Steiger's $t$ test	LPFS-BF $R^2$	PID-5 $\Delta R^2$	PID-5 $R^2$	LPFS-BF $\Delta R^2$
	LPFS-BF	PID-5					
WHO-5 Wellbeing Index <sup>a</sup>	-0.57	-0.48	2.55**	.308**	.004	.231**	.082**
PSI severity <sup>a</sup>	0.76	0.74	0.76	.557**	.057**	.542**	.071**
SMI healthy functioning modes							
Healthy adult <sup>b</sup>	-0.64	-0.56	1.99**	.409**	.009	.318**	.100**
Happy child <sup>b</sup>	-0.73	-0.65	3.69**	.527**	.014**	.418**	.124**
SMI dysfunctional inner child modes							
Vulnerable child <sup>b</sup>	0.73	0.74	0.30	.539**	.072**	.546**	.055**
Angry child <sup>b</sup>	0.62	0.75	3.74**	.390**	.177**	.565**	.003
Enraged child <sup>b</sup>	0.44	0.56	2.75**	.197**	.115**	.312**	.000
Impulsive child <sup>b</sup>	0.58	0.69	2.89**	.334**	.151**	.482**	.002
Undisciplined child <sup>b</sup>	0.57	0.61	0.97	.322**	.073**	.377**	.018**
SMI dysfunctional coping modes							
Compliant surrenderer <sup>b</sup>	0.48	0.46	0.44	.227**	.020	.214**	.033**
Detached protector <sup>b</sup>	0.70	0.71	0.28	.488**	.068**	.507**	.050**
Self-aggrandizer <sup>b</sup>	0.41	0.60	4.55**	.144**	.186**	.363**	.006
Bully and attack <sup>b</sup>	0.41	0.61	4.84**	.167**	.215**	.367**	.013
SMI internalized authority modes							
Punitive parent <sup>b</sup>	0.65	0.69	1.08	.416**	.083**	.471**	.028**
Demanding parent <sup>b</sup>	0.51	0.49	0.45	.252**	.025**	.244**	.033**

Note. LPFS-BF 2.0 = Level of Personality Functioning Scale-Brief Form 2.0; PID-5 = Personality Inventory for DSM-5; PSI = Personality Severity Index; SMI = Schema Mode Inventory. All correlations were significant at the .001 level.

<sup>a</sup> $n = 228$ , <sup>b</sup> $n = 153$ .

\* $p < .05$ , \*\* $p < .001$ .

congruence coefficients indicated fair structural similarity across the two samples. The less clear two-factor structure in the sample of prisoners might be a natural artefact of the different ranges of personality pathology in this sample as evident from the descriptive statistics presented in Table 2 and Table S1. Another plausible explanation might be a suboptimal item formulation in the LPFS-BF 2.0 to capture the typical manifestations of externalizing personality pathology as expressed in the types of PD that are most prevalent in forensic samples (e.g., antisocial and narcissistic). For example, the LPFS was designed to tap features of narcissistic functioning (e.g., an unnuanced self-appraisal in terms of self-aggrandizing), so it seems likely that the simple structure of the LPFS-BF 2.0 does not provide adequate coverage in that regard. Likewise, the LPFS explicitly relates to some features of aggression in moderate impairment of identity (“Threats to self-esteem may engender strong emotions such as rage”) and severe impairment of identity (“Hatred and aggression may be dominant affects”). This suggests that problems of narcissism and aggression might not be as clearly captured by the LPFS-BF 2.0. The lower LPFS-BF 2.0 score in the prison sample relative to the outpatient sample seems consistent with this hypothesis, because prevalence studies indicate that forensic patients are at least as personality disordered as outpatients (de Ruiter & Trestman, 2007). However, the LPFS-BF 2.0 does cover core functions that are potentially relevant to narcissistic and antisocial functioning including Item 2 (self-appraisal), Item 3 (emotion regulation), Item 7 (empathy or callousness), Item 8 (tolerance of others’ opinions), and Item 12 (cooperation with others). Finally, a recent study suggests that features of antisocial PD and impulsive-antisocial features of psychopathy, which characterize forensic populations, might not be sufficiently captured by measures of personality functioning in general (Sleep et al., 2017).

### **Capturing general personality severity and reduced well-being**

The LPFS-BF 2.0 total scale and subscales showed large associations with the total PID-5 mean score (proxy for severity), supporting that elevated LPFS-BF 2.0 impairment is a natural reflection of severity related to elevated pathological traits in general (g-factor; Sharp et al., 2015). Likewise, the LPFS-BF 2.0 total scale and subscales showed a large association with SCL-90-R derived PD severity. The nonsignificant differences between self- and interpersonal functioning in this matter suggest that both components are equally important for describing severity of impairment, which seems consistent with the AMPD. Moreover, the LPFS-BF 2.0 total scale and self-functioning subscale showed large associations with poor well-being, whereas this association was only moderate for the interpersonal functioning subscale. This might indicate that problems in self-functioning are more strongly associated with experiences of subjective distress and lack of well-being, which is essentially consistent with content in LPFS self-functioning related to emotion regulation (identity) and fulfillment (self-direction).

### **Association with schema modes**

The LPFS-BF 2.0 scales were also meaningfully associated with clinically and psychotherapeutically derived constructs of

modes from the schema mode model of personality pathology (Bamelis et al., 2011; Keulen-de Vos et al., 2016; Roelofs, Muris, & Lobbestael, 2016; Young et al., 2003). As would have been expected, lack of healthy adult mode (ability to keep a sustaining and fulfilling lifestyle by taking care of one’s own needs) showed large associations with LPFS-BF 2.0, with no significant difference between subscales, indicating that such healthy adult features might comprise potential core aspects of healthy personality functioning with approximately equal coverage of self- and interpersonal functioning. This is consistent with the psychotherapeutic goal of strengthening the healthy adult mode (the patient’s own internalized “good parent”) for this mode to soothe the vulnerable child mode and regulate the enraged child mode (Young et al., 2003).

For the self-functioning subscale we found predominant associations with modes of vulnerable child (feeling needy, lonely, worthless, sad, abandoned, or abused), reduced happy child (healthy sense of fulfillment, being loved, understood, safe, and curious), internalized punitive or demanding parent (self-punishment, self-loathing, self-criticism, shame, and unreasonably high internal standards that also compromise authenticity and fulfillment), undisciplined child (difficulties pursuing goals and gives up easily), compliant surrenderer (coping by means of overcompliance with others at the expense of one’s own authenticity and fulfillment; “underdog”), and detached protector (withdraws or disconnects when emotions are distressing, often causing restriction in range of emotion; associated with depersonalization or feelings of emptiness).

For the interpersonal functioning subscale we found predominant associations with modes of angry or enraged child (irritability, rage, and aggression toward others), impulsive child (attempts to fulfill own needs in an immature and harmful manner that hurts or causes problems to others), bully and attack (strategically dominating, bullying, or hurting others as protection against being hurt by others), and self-aggrandizer (cooperates only for personal gain and is generally not interested in taking other’s perspective into account).

Taken together, this pattern of associations indicates that content of the LPFS-BF 2.0 somewhat aligns with clinically derived concepts of personality functioning, and the two LPFS-BF 2.0 subscales differentiate some mode features related to self and others in a conceptually coherent manner.

### **The contribution of LPFS-BF 2.0 functioning to PID-5 traits**

In comparison to PID-5 traits, the LPFS-BF 2.0 seems particularly useful for capturing (lack of) psychological health, which includes healthy adult features with adaptive problem solving (e.g., SMI Item 28, “I can solve problems rationally without letting my emotions overwhelm me”) and identity (e.g., SMI Item 118, “I have a good sense of who I am and what I need to make myself happy”), as well as happy child features (e.g., SMI Item 17, “I feel content and at ease,” and Item 19, “I feel connected to other people”). Moreover, the LPFS-BF 2.0 is also particularly useful in capturing compromised features of integrity, identity, and authenticity due to overcompliance with others (e.g., SMI Item 18, “I change myself depending on the people I’m with, so they’ll like me or approve of me,” and Item 52, “I let other people get their own way instead of expressing my

own needs”). Finally, the LPFS–BF 2.0 is also particularly useful for capturing reduced well-being (e.g., feeling calm, cheerful, and in good spirits, including a daily life filled with interesting things).

On the other hand, more specific personality problems and externalizing features such as angry or enraged child mode, bully and attack mode, and self-aggrandizer mode are best accounted for by PID–5 traits. Indeed, both the LPFS–BF 2.0 and the PID–5 supplemented the other across the majority of analyses, albeit with small added amounts of variance at times. Therefore, it seems that the LPFS–BF 2.0 and PID–5 might benefit from aspects of one another in capturing personality pathology. This is consistent with previous research showing that impairment of personality functioning and pathological personality traits are not clearly separate phenomena (Anderson & Sellbom, 2018; Calabrese & Simms, 2014; Few et al., 2013; Liggett et al., 2017; Simms & Calabrese, 2016; Sleep et al., 2017; Zimmermann et al., 2015). Yet, to our knowledge, no theory has ever claimed that functioning and traits should be clearly distinct from one another. In fact, severity of impaired personality functioning has also been defined as the impact of underlying dysfunctional personality traits on psychosocial functioning (Olajide et al., 2017). Accordingly, severity is not just about intensity of pathological traits per se, but rather their impact on everyday functioning. For example, a severe rating of worrying might involve that constant worrying stops the patient from doing things he or she needs to do (severe level), whereas another individual might also exhibit pronounced worrying but handle this in an adaptive and fulfilling manner as a musician or artist (mild level). In the ICD-11 diagnostic guidelines, personality traits are explicitly defined as qualifiers that contribute to the individual expression of personality dysfunction (World Health Organisation, 2018). It therefore makes sense that elevated PID–5 scores are strongly associated with the LPFS–BF 2.0 score. For example, a high score on PID–5 emotional lability usually indicates that this pathological trait causes some dysfunction in everyday life consistent with LPFS–BF 2.0 Item 3, “My emotions change without me having a grip on them.”

However, consistent with the idea that LPFS is about general or transdiagnostic impairment including healthy ability to fulfill one’s own needs and pursue personal goals in everyday life, the LPFS–BF 2.0 predominantly captures lack of healthy adult functioning as well as lack of fulfillment due to absence of an inner content or happy child. Notably, the LPFS–BF 2.0 is also slightly superior in capturing unrelenting personal standards in terms of an internalized demanding parent or authority and overcompliance, which together could reflect core personality problems of unreasonable high standards and orientation toward external approval in setting goals (self-direction), which in return might compromise one’s ability to live a genuinely fulfilling and authentic life.

### Limitations and future directions

Certain limitations and recommendations for future research should be emphasized. First, we only used concurrently self-reported LPFS–BF 2.0 data (as opposed to interview ratings of LPFS) potentially involving a risk for artificially high

correlations among measures due to monomethod bias (Campbell & Fiske, 1959). For example, the blurred line between LPFS–BF 2.0 and PID–5 could partially be attributed to the monomethod cross-sectional self-report method, which likely inflates all correlations due to shared method variance. Consequently, future research should test incremental validity of functioning versus traits by using different methods. Second, participants were not diagnostically characterized, thus, co-occurring diagnoses were not taken into account. Third, this study did not include any criterion measures explicitly covering aspects of social cognition and mentalization as well as identity disturbance and self-structure or narrative. Accordingly, future studies should corroborate the construct validity of the LPFS–BF 2.0 using other criterion measures along with interview-rated or informant-reported data; and more research should be done in forensic populations including externalizing personality pathology.

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