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Validity of the DSM-5 Levels of Personality Functioning Scale-Self Report

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Abstract

In this study we examined the structure, reliability, and validity of the Levels of Personality Functioning Scale-Self Report (LPFS-SR) in three large community samples. The LPFS-SR is a questionnaire whose content corresponds directly to the DSM-5 Alternative Model of Personality Disorders, Criterion A. We found that the LPFS-SR was highly reliable across a brief retest interval. LPFS-SR scores correlated substantially with a wide range of maladaptive personality traits, personality disorder constructs, and interpersonal problems. The LPFS-SR did not correlate as strongly with aspects of personality with less clear relations to distress and dysfunction. Data further support that identity, self-direction, intimacy, and empathy components of the LPFS-SR can be characterized by a single factor and have similar correlations with criterion variables, consistent with the hypothesis that DSM-5 Criterion A is a relatively homogeneous construct. Overall, these results support the validity of the LPFS-SR, highlight important issues in assessing personality pathology, and point towards novel avenues for research on personality disorder classification.

Keywords: DSM-5 alternative model of personality disorder, personality pathology, levels of personality functioning, personality disorder

A large empirical literature has established that variants of personality disorder (PD) tend to be highly inter-correlated (Widiger & Rogers, 1989; Wright et al., 2012). A number of alternative perspectives have been offered to account for the co-occurrence of different sorts of personality problems. The *Diagnostic and Statistical Model of Mental Disorders* (American Psychiatric Association, 1980; 2013) conceptualizes this pattern in medical terms, describing the "comorbidity" of putatively discrete conditions, even though the strong and consistent pattern of co-occurrence is incompatible with the assumption that PDs are discrete. Although not recognized within the current PD classification, various theorists have proposed explanations for such findings. For example, Kernberg (1984) offered an organizational continuum of personality disturbance involving identity, maturity of defenses, and reality testing which has had a lasting influence on psychodynamically-oriented research on PD classification (e.g., Lowyck et al., 2013; Zimmermann et al., 2012). From this perspective, people with certain problems will also be more likely to have others as well because of underlying deficits in the structure of their personality. Other prominent models have focused on two cross-cutting dimensions, such as Livesley's (1998) interpersonal and self dysfunction or the agency and communion dimensions of interpersonal theory (Hopwood, Wright, Ansell, & Pincus, 2013; Pincus & Hopwood, 2012; Parker et al., 2004). All of these models have in common the general notion that the co-occurrence of different features of PD is due to a common underlying core of *personality pathology severity* which involves some combination of interpersonal dysfunction and intrapsychic disorganization (Bender et al., 2011).

A number of authors have emphasized the clinical value of personality pathology severity, as distinct from different types or styles of PD (Hopwood et al.,

2011; Luyten & Blatt, 2011; Tyrer, 2005). The perspective that the covariance among PDs can be reconceptualized as an important diagnostic variable has been supported by factor analytic studies of pathological personality features that typically show a substantial first or general factor (Sharp et al., 2015; Wright, Hopwood, Skodol, & Morey, 2016). Such studies have furthermore shown that severity—not style—of PD is the single most important predictor of therapeutic outcome as well as concurrent and prospective dysfunction (Hopwood et al., 2011; Parker et al., 2002; Tyrer & Johnson, 1996), and that severity tends to track with clinical improvement whereas personality style tends to be relatively stable over time (Wright et al., 2016).

Measures of Personality Pathology Severity

A number of tools have been developed to assess personality pathology severity. Semi-structured interview and questionnaire methods are available to operationalize the dimensions of Kernberg's model or personality organization (Kernberg & Clarkin, 1995), with some promising results in terms of correlations with personality pathology and related problems (e.g., Lowyck et al., 2013). However, research also suggests a relatively unstable structure of this model across samples (Ellison & Levy, 2012; Lenzenweger et al., 2001). The *Severity Indices of Personality Problems* (SIPP; Verheul et al., 2008) contains 118 items with 16 facets that load onto 5 high-order factors labeled self-control, identity integration, relational capacities, responsibility, and social concordance. However, the first factor explained the lion's share of the covariance of SIPP scales, and the correlations among these factors tend to be high (Verheul et al., 2008; see also Rossi, Debast, & van Alphen, 2017). This overall pattern is consistent with theories of personality pathology that imply that various personality problems will tend to go together. The

General Assessment of Personality Disorder (GAPD; Livesley, 2009) contains 144 items loading onto 19 subscales loading onto two primary higher-order factors. Like the SIPP, however, the GAPD scales are strongly intercorrelated (Hentschel & Livesley, 2013).

An alternative approach has been to measure personality pathology severity as a single dimension. For instance, Tyrer and Johnson (1996) proposed rating severity based on the number of PD diagnoses received by a given patient. Similarly, Bornstein's (1998) *Personality Pathology Rating Scale* (PPRS) provides a single rating of personality pathology severity along a scale from 0-50 in a manner similar to the DSM *Global Assessment of Functioning Scale* (APA, 1980). Morey et al. (2011) showed that a unidimensional scale composed of GAPD and SIPP items could adequately represent personality pathology in terms of self and interpersonal dysfunction and was strongly correlated with different variants of PD as well as the co-occurrence of different PDs. Morey, Bender, and Skodol (2013) reported that a single personality pathology severity item had substantial correlations with other indicators of severity and impressive sensitivity for detecting patients with at least one PD diagnosis.

The development of an array of instruments designed to measure personality pathology severity demonstrates the substantial transtheoretical interest in capturing the general features of personality pathology but also highlights ambiguities regarding the structure of those features. Although many measures and models of the severity of personality pathology exist, they differ in terms of the number of dimensions they try to capture. There are two issues with models that propose multiple dimensions of personality pathology. First, in practice these dimensions either tend to be relatively unstable across samples or to be highly

intercorrelated and to have relatively similar patterns of validity correlations. Such findings call into question the practical distinctiveness of different dimensions of personality pathology severity. Second, to the degree that reliably distinct dimensions can be identified, concerns might be expressed about the degree to which indicators of general personality pathology (i.e., what all variants of PD have in common) are inadvertently tapping personality style (i.e., what distinguishes one patient with a PD diagnosis from another) (Oltmanns & Widiger, 2016).

DSM-5 Alternative Model of Personality Disorders Criterion A

The substantial body of theory and research on general features of personality pathology influenced the development of the DSM-5 alternative model of personality disorders (Skodol et al., 2011), which conceptualized PD diagnosis in terms of core deficits in self and interpersonal functioning (Criterion A) and stylistic traits that distinguish variants of PD (Criterion B). In this scheme, criterion A features capture what all variants of PD have in common. Based on the existing literature (Bender et al., 2011), it was determined that Criterion A features would focus on self (identity and self-direction) and interpersonal (intimacy and empathy) forms of dysfunction, although there was a general recognition that these features would tend to be strongly intercorrelated (Morey et al., 2011). The *Levels of Personality Functioning Scale* (LPFS; Bender et al., 2011) was developed as a clinician rating tool for the assessment of criterion A features. Initial research supports the reliability and validity of the LPFS (Zimmermann et al., 2014; 2015; Morey et al 2013).

Recognizing the need for a questionnaire version of the LPFS for clinical research and practice, Hutsebaut, Feenstra, & Kamphuis (2016) created a 12-item questionnaire with items related to dysfunctions in identity, self-direction, empathy,

and intimacy. This measure had internal consistency value of .69 for the total score, which correlated significantly with other assessments of personality pathology severity and distinguished patients with and without PD diagnoses. However, the content of this brief scale does not correspond fully to the DSM-5 AMPD Criterion A features and validity correlations may have been attenuated by its brevity.

Huprich et al. (in press) developed the 132 item DSM-5 Levels of Personality Functioning Questionnaire in a small sample of psychiatric outpatients. This measure attempts to measure all four domains of the LPFS in both social and work domains. The initial validation study showed that its scales had internal consistency estimates in the range of .70-.90, and its scales correlated substantially with maladaptive personality traits and other indicators of well-being. The small validation sample prohibited covariance analysis so validation of the proposed structure has not yet occurred, but the pattern of correlation tended to be similar across criterion variables, as has been the case with other LPFS measures and in line with the notion that the LPFS mostly represents a unitary construct. Like the Hutsebaut measure, the content of the Huprich et al. measure does not directly correspond to the DSM-5 LPFS.

In addition to describing general impairments in Criterion A, the alternative model also describes how each of these impairments would manifest in specific categorical PDs. For instance, intimacy problems in borderline PD was specified as involving an intensity that involves both mistrust and neediness. Though linked to the Criterion A model, these impairment criteria resemble the diagnostic criteria in the Section II model of the DSM-5. Anderson and Sellbom (in press; see also Liggett et al., 2017) developed disorder-specific impairment measures for each of the six categorical PDs listed in the alternative model. The contents of these measures

mapped precisely onto the DSM-5, but at the level of individual PDs, rather than the overall LPFS model. However, Anderson and Sellbom found limited support for the hypothesis that impairment was specific to different PDs. Instead, their results suggested that impairment reflects a broader feature of a person's overall level of functional severity. Roche, Jacobson, and Pincus (2016) reported similar findings using a measure designed for experience sampling research.

Morey (2017) developed the *Levels of Personality Functioning Scale-Self Report* (LPFS-SR), an 80-item questionnaire whose items match the LPFS model directly in terms of both content and item weighting. Preliminary results with the LPFS-SR suggested that the four component scales are highly intercorrelated and show similar patterns of correlation with criterion variables, consistent with the notion that they are capturing a single dimension of personality pathology severity. Convergent validity correlations with other global PD severity measures, including the GAPD and SIPP, were substantial.

The Current Study

The initial LPFS-SR validation study (Morey, 2017) focused on establishing the internal consistency of the LPFS-SR scales and its convergent validity with other measures of personality pathology severity. The purpose of the current study is to build on these initial findings by examining the construct validity of the LPFS-SR more broadly. To this end, the LPFS-SR was administered along with a wide variety of measures relevant to personality pathology in three community samples. We had five general hypotheses.

First, we expected the LPFS-SR scales to be highly stable over a short-term retest interval, both in terms of retest correlations and mean-level changes. Second,

we expected the LPFS-SR component scales to be highly correlated, suggesting a general factor of the severity of personality pathology.

Third, we expected the LPFS-SR to be strongly and similarly correlated with a range of maladaptive personality features. This includes maladaptive traits, personality disorders, interpersonal problems, and normal range traits that have established associations with personality pathology (i.e., neuroticism, low agreeableness, and low conscientiousness (Morey et al., 2002; Samuel & Widiger, 2008). This hypothesis is based on the notion that the LPFS-SR should be measuring aspects of dysfunction that are common to all variants of PD and related problems.

Fourth, we expected that the LPFS-SR would be less related to personality features that are not obviously maladaptive (e.g., extraversion, agreeableness, interpersonal efficacies, values, and sensitivities, stylistic variation in interpersonal warmth and dominance). Demonstrating relatively lower correlations with these variables would help establish the discriminant validity of the LPFS-SR with respect to personality features that do not have clear implications for distress or dysfunction.

Fifth, we expected relatively limited discriminability between the various components of the LFPS-SR. This would be demonstrated by relatively similar correlations between these scales and validating variables. Coupled with strong component intercorrelations (hypothesis 2), this pattern would be consistent with the assumption that all aspects of personality pathology severity capture a relatively homogeneous core, even though this core includes aspects of both self and interpersonal dysfunction. We say "relatively" limited, because it is also true that some forms of maladaptive personality do appear to be more related to certain forms of personality pathology severity than others. For instance, we anticipated

traits related to irresponsible and impulsive behavior to be more related to self-direction and traits related to mistrust and paranoia to be more related to intimacy.

Method

We administered questionnaires to three samples (Ns = 1008, 1003, 1101) of adult English-speaking Amazon Mechanical Turk workers who were paid $6, $6, and $4, respectively, for completing the survey. Research consistently shows that crowdsourcing platforms such as Mechanical Turk produce data of equal and often better quality than other sampling approaches (e.g., undergraduate or patient populations) Buhrmester, Kwang, & Gosling, 2011; Casler, Bickel, & Hackett, 2013; Miller, Crowe, Weiss, Maples-Keller, & Lynam, 2017).

Some participants completed more than one study; we identified 1976 independent participants. Due to an investigator error, some participants who completed the same study twice did not have linking ID numbers. All participants who completed in the same study twice were identified so that cross-study internal consistency estimates could be calculated based upon non-duplicate cases, and 353 participants who completed the LPFS-SR at least twice were identified and used to calculate retest reliability. The average age was 35.44 (SD = 11.23) in sample 1, 35.47 (SD = 1.79) in sample 2, and 34.98 (SD = 1.37) in sample 3. Just over half of the participants were men (55% in sample 1, 53% in samples 2 and 3); 73%/67%/65% were white/European-American, 7%/8%/7% black/African-American, 10%/14%/16% Asian/Asian-American, 7%/8%/9% Latin-American, and 3%/3%/3% from other racial categories. About half (55%/52%/53) were single; 37%/39%/39% were married, 6%/7%/6% divorced, and 1% were widowed or separated in all three samples. All participants provided consent prior to participation and this research

was approved by the appropriate Institutional Review Board. Data are posted at osf.io/v2s8u.

Measures

The *Level of Personality Functioning Scale-Self Report* (LPFS-SR; Morey, 2017). The LPFS-SR was administered to all participants. Each LPFS-SR item is answered on a 4-point scale ranging from "Totally False, not at all True" to "Very True". Each item is weighted according to its putative severity within the LPFS conceptualization. Because the DSM-5 LPFS level 0 indicators imply "little or no impairment" whereas all other indicators imply some impairment, the items on the LPFS-SR were weighted as follows: level 0 items are weighted -.5, level 1 ("some impairment") are weighted +.5, level 2 ("moderate impairment") weighted +1.5, level 3 ("severe impairment") weighted +2.5, and level 4 ("extreme impairment") items are weighted +3.5. This weighting provides a direct match to the DSM-5 characterization of different indicators reflecting different levels of severity, and effectively deals with the fact that some DSM-5 LPFS descriptors are positively related to health whereas most are negatively related to health. We present results for the LPFS-SR total score, self and interpersonal domain scores, and identity, self-direction, intimacy, and empathy component scores.

The *Big Five Inventory-2* (Soto & John, 2017), a 60-item measure of normal range big five personality traits, and the static form of the *Computer Adaptive Test of Personality Disorder*(CAT-PD; Simms et al., 2011), a 212-item measure of 33 maladaptive personality traits, were administered to sample 1.

The *Personality Diagnostic Questionnaire-4* (PDQ-4; Hyler, 1994), which has one true-false item for every PD criterion in DSM-5 Section II was administered to sample 2. Symptom counts were used in this paper. The *Personality Inventory for*

DSM-5 (PID-5; Krueger et al., 2012), a 221-item measure with 25 scales measuring the maladaptive traits in criterion B of the DSM-5 AMPD, was also administered to sample 2.

Four interpersonal circumplex measures were administered to sample 3. The *Inventory of Interpersonal Problems-Short Circumplex* (IIP-SC; Hopwood et al., 2008; Soldz et al., 1995) is a 32-item measure of interpersonal behaviors a person reports doing too often or not enough. The *Interpersonal Sensitivities Circumplex* (ISC; Hopwood et al., 2011) is a 64-item measure of others' behavior that the respondent finds annoying. The *Circumplex Scales of Interpersonal Values* (CSIV; Locke, 2000) is a 64-item measure of an individual's goals when interacting with others. The *Circumplex Scales of Interpersonal Efficacies* (CSIE; Locke & Sadler, 2007) is a 32-item measure of the kinds of behaviors the respondent feels they are effective at when interacting with others.

Analyses

Cronbach's alpha was used to evaluate internal consistency. Principle component analysis was used to test multidimensionality. Pearson correlations were computed to evaluate retest stability. Mean-level changes were evaluated based on the effect sizes of raw score changes across the retest interval.

To test hypotheses 2-5, Pearson correlations were computed between each scale from the validation measures and each level of the LPFS-SR (total; self and interpersonal domains; identity, self-direction, intimacy, and empathy facets) with outcome variables. For the interpersonal circumplex, we summarized correlations with the octant scales in terms of the average correlation across all octants, and correlations with dominance and warmth vectors. Given the number of correlations we computed, the large effect sizes we anticipated, and our relatively large

samples, we focused on the magnitudes of effect rather than statistical significance. In general, we expected LPFS-SR variables to correlate strongly (e.g., .50 [Cohen 1988]) with all validating variables except those that indicate a specific personality style (e.g., normal range traits, interpersonal dominance and warmth) as opposed to a maladaptive personality feature.

Differences in correlations across the four LPFS-SR facet scores were tested with Steiger z-tests to evaluate the degree to which different aspects of personality pathology severity correlate with maladaptive personality features. Recall that our general hypothesis was that different aspects of personality pathology severity should correlate similarly with maladaptive personality features. As these were highly powered tests, even small differences in correlation were statistically significant (i.e., differences > .03 were significant at $p < .001$). As such, we only interpreted correlations differences of at least |.10| as meaningful.

Results

Means, standard deviations and intercorrelations between LPFS-SR components for participants' first administration (N = 1976) across three samples are presented in Table 1. All component score intercorrelations exceeded .75. The first and second eigenvalues from a principal components analysis of the four component scores were 3.34 and .30, respectively. These results support our first hypothesis that a strong general factor underlies LPFS-SR components.

Internal consistencies for participants' first administration of the LPFS-SR across the 3 samples (N = 1976) were .95 for the total score, .92 and .91 for self and interpersonal domains, and .86, .86, .80, and .86 for identity, self-direction, intimacy, and empathy components, respectively. Means and internal consistency values are comparable to the results reported in Morey's (2017) initial validation

paper. Re-test reliabilities (N = 353; M = 15.26 days, SD = 7.96, range = 10-29) were .91 for the total score, .90 and .89 for self and interpersonal domains, and .84, .88, .81, and .87 for identity, self-direction, intimacy, and empathy components, respectively. There was also minimal mean change over time, with the total score decreasing by .67 on average (SD = 13.09). These results support our second hypothesis that the LPFS-SR is reliable both in the sense of internal consistency and in terms of mean-level change over a brief interval.

Tables 2-4 present correlations between the LPFS-SR and normal traits, maladaptive traits, and PDs. These values were computed for all participants. To evaluate the impact of duplicate cases (i.e., people who participated in more than one of our three studies), we also computed these values only for each participant's first administration (N = 1976). Correlation differences between the full sample and subsampled were very small (M = .02, SD = .04).

Tables 2-4 are organized in a manner designed to ease interpretation in terms of hypothesized patterns. Rows depict correlations with the total score, the self and interpersonal composite scores, and the four component scores. Columns are ordered according to their magnitude of correlation with LPFS-SR components. Within each test, the first group includes variables that correlate strongest with identity, the second with self-direction, and so on. Finally, bold values are at least .10 higher than any other value (i.e., a self domain value .10 larger than an interpersonal domain value, or an intimacy value .10 larger than any other component).

Correlations between LPFS-SR variables and normal range traits are given in Table 2. Results were consistent with our third and fourth hypotheses that the LPFS-SR total score would relate strongly (i.e., > |.50|) with neuroticism, agreeableness,

and conscientiousness, and somewhat less so with openness and extraversion. There was some specificity across LPFS-SR domains and components. The self-domain was more strongly correlated than the interpersonal domain with neuroticism, extraversion, and conscientiousness, whereas the interpersonal domain had stronger correlations with agreeableness. At the component level, identity was specifically associated with neuroticism, self-direction with conscientiousness, and intimacy with agreeableness.

Correlations between LPFS-SR variables and maladaptive traits as measured by the CAT-PD and PID-5 are given in Table 3. With respect to the CAT-PD, 21/33 scales correlated at least .50 with the LPFS-SR total score and 6 of the remaining 12 correlated at least .40. These values were 18/25 and 4/7 for the PID-5. This mostly supports our third hypothesis that maladaptive traits would generally correlate with personality pathology severity, while also suggesting that some forms of maladaptive personality are not as strongly linked to general personality pathology. With respect to our fifth hypothesis, there was some evidence that traits involving distress were most strongly related to identity, traits involving disinhibition were most strongly related to self-direction, traits involving antagonism were more related to empathy, and traits related to detachment were more related to intimacy. However, overall these correlations were fairly strong across LPFS-SR domains. In only 6 of 58 scales was there a correlation .10 higher for one LPFS-SR component than the next highest component. Thus, results mostly support our fifth hypothesis, with some evidence of connections between LPFS-SR scales and major domains of maladaptive personality functioning.

Correlations between LPFS-SR variables and PDs are given in Table 4. All but 2 of 12 correlations with the total score were > .50 and the other two were > .40,

supporting our third hypothesis. There was again relatively limited differentiation across LPFS-SR components. Although avoidant, depressive, and dependent composites correlated .10 stronger with the self than interpersonal domain, in no case was any correlation .10 greater with one LPFS-SR component than the next strongest component. These results generally support our fifth hypothesis that different aspects of personality pathology severity would be similarly related to maladaptive personality constructs.

Finally, correlations between LPFS-SR variables and interpersonal circumplex scores are given in Table 5. In this table, the columns represent three interpersonal scores: the total score (average of all items on the instrument) and dominance and warmth vector scores. Each instrument is listed separately from top to bottom, and rows within each instrument signify the LPFS-SR variables. Hypothesis 3, that the correlation between the LPFS-SR total score and the total number of interpersonal problems would be > .50, was supported. The LPFS-SR total, domain, and component score correlations with the total number of problems were also at or near .70.

Our fourth hypothesis was that correlations with interpersonal style (dominance and warmth) and the total scores of other surfaces (sensitivities, values, and efficacies) would be lower was partially supported. All of these correlations were < |.40|, with the exception that correlations between interpersonal values and the severity of personality pathology were stronger than expected. Moreover, there were some moderately large correlations with a cold interpersonal style and the total number of sensitivities, efficacies, and values. Correlations with interpersonal style suggest that people who value and are capable of being cold with others have more personality problems. Correlations with overall sensitivities

indicate people with more personality pathology are also more sensitive to others' interpersonal behavior (Good & Hopwood, under review). Associations with overall efficacies suggests that individuals with more personality pathology regard themselves as relatively less socially effective. None of these correlations were particularly surprising, albeit not hypothesized. It was somewhat surprising that personality pathology severity correlated significantly with overall values, however. This construct represents the importance attached to specific interpersonal behavior in a particular relationship.   For example, items from the CSIV state: When I am with her/him/them, it is x that I appear y, where y is some interpersonal behavior (e.g., confident, forceful, compliant) and x is a rating of importance. Thus this correlation would seem to suggest that people with more severe personality pathology feel that it is more important for them to be a certain way in relation to others, seeming to adhere more strongly to a belief that there is a "correct" way to behave in interpersonal situations.

Discussion

The *Levels of Personality Functioning –Self Report* (LPSF-SR) is the only freely available self-report instrument that corresponds precisely to the content and scoring of the DSM-5 alternative model Levels of Personality Functioning Scale (i.e., Criterion A). The initial validation of the instrument showed that its scales had high internal consistency and intercorrelations and that it converged well with other measures of personality pathology severity. In this study, we examined internal structure, retest reliability, and associations with a wide range of personality variables in three relatively large community datasets. We had five hypotheses. First, we anticipated a strong general factor would underlie LPFS-SR component scales. Second, we expected the LPFS-SR to be reliable in terms of both internal

consistency and retest stability. Third, we expected the LPFS-SR scales to correlate substantially with a diverse array of maladaptive personality features. Fourth, we expected the LPFS-SR scales to show discriminant validity in relation to personality variables that are not as clearly linked to maladaptive behavior. Fifth, we expected to find relatively similar validity correlations across the LPFS-SR components. We found strong support for the first two hypotheses and general but not full support for hypotheses 3-5.

These results are fairly convincing with respect to the ability of the LPFS-SR, and thus personality pathology severity as represented by Criterion A of the DSM-5 alternative model, to capture a wide range of maladaptive personality features. Nearly all of the correlations between the LPFS-SR total score and clearly maladaptive variables were substantial, and the large majority were above our predetermined cutoff of .50. There were interesting exceptions. For instance, traits with a more ambiguous link to maladaptivity, such as workaholism, perfectionism, and exhibitionism had lower correlations with the LPFS-SR. These traits are notable because, while maladaptive, they are connected with the tails of personality domains that are generally adaptive (i.e., high conscientiousness and high extraversion). For many individuals, being a hard worker who has high standards and is socially confident are positive attributes. Thus, the complicated nature of the relation between maladaptive behavior and these particular traits is a likely explanation for their relatively low correlations with the LPFS-SR. In general, the results of this study support for our first hypothesis despite some exceptions with respect to specific traits.

This study also showed discriminant validity of the LPFS-SR with respect to variables with a more ambiguous connection to personality pathology. We found

moderate correlations suggesting that people with more severe personality pathology were less extraverted and open, which is consistent with meta-analytic trends (e.g., Samuel & Widiger, 2008). Although we did not hypothesize that the LPFS-SR would correlate with general interpersonal sensitivities, values, and efficacies, these correlations should not be surprising in retrospect. The finding that people with less adaptive personalities also reported trying to maintain interpersonal distance and being less effective at being connected to others makes intuitive sense. Overall, it seems that our data suggest that variables with strong and clear links to personality pathology will tend to correlate strongly with the LPFS-SR (hypothesis 3), variables without conceptual links to personality pathology will correlate weakly with the LPSF-SR (hypothesis 4), and that there is a third group of variables with equivocal links to personality pathology that will correlate moderately with the LPSF-SR (e.g., extraversion, openness, interpersonal values and efficacies).

Hypothesis 5 was perhaps the most complicated. On the one hand, a premise of the DSM-5 alternative model is that Criterion A should capture what personality pathology has in common, whereas Criterion B should capture what distinguishes variants of PD. There is an interesting body of research showing that maladaptive personality can be decomposed into general and specific elements (Hopwood et al., 2011; Sharp et al., 2015; Wright et al., 2016). It follows that a Criterion A measure should be relatively homogeneous, which was consistent with the finding that the LPFS-SR component variance can be summarized with a single factor. However, it is also true that theories of personality pathology have emphasized different kinds of content (Bender et al., 2011). In the DSM-5 alternative model, it is expected that personality pathology will be reflected in self and interpersonal domains, which are further broken down into 4 components. Some discriminant validity between these

components was evidenced by differential correlations with criterion variables in our data.

The discrimination we identified between these components suggested that the LPFS-SR components map to some degree onto four major domains of personality pathology: identity with neuroticism, self-direction with disinhibition, intimacy with detachment, and empathy with antagonism. One popular critique of the DSM-5 alternative model is redundancy (e.g., Zimmermann et al., 2015), and these results are somewhat consistent with that critique. It is inefficient to have two sets of criteria that tap relatively similar variables. In the case of the DSM-5, previous research shows that Criterion B captures severity in a manner that can be modeled as a single factor (Wright et al., 2012), and these results indicate that to the degree Criterion A captures style, it does so in a manner that corresponds loosely to established models of individual differences.

It follows that a next step in refining the alternative model would be to create some separation between personality pathology severity and PD style. We see essentially four ways to accomplish this goal in future revisions of the alternative model. First, severity could be removed from Criterion B, such that dysfunction was captured entirely within the first Criterion, and the second criterion focused entirely on individual differences in normal range traits (Hopwood, 2011). However, this is challenging, because there are, in fact, different forms of distress which probably correspond to major domains of personality pathology. To the degree that a unidimensional personality pathology scale were created, we would anticipate that it would be strongly related to neuroticism (Oltmanns & Widiger, 2016). In this sense, it is a strength of the LPFS-SR that it has content that seems to be related to multiple major domains of personality pathology beyond neuroticism

Second, there could be separate ratings of personality severity and style for each major trait domain. For instance, Widiger and Trull (2007) proposed a two-step process, in which normal range traits are first assessed, and functioning is assessed for any trait found to be extreme. This approach accounts for the fact that a person with a high score on a given trait may not necessarily be dysfunctional. The potential drawback of this approach is that it might be relatively inefficient, in that two features must be assessed for each component of personality – their scores relative to others, and the degree to which the attribute is related to distress and dysfunctional behavior. Furthermore, it is as yet unclear whether various functional impairments can be independently linked to distinct traits. For example, if an individual is extremely low on extraversion and agreeableness then interpersonal dysfunction is probable, but it is unclear which of these traits should be linked specifically to the dysfunction.

Third, personality pathology severity could be conceptualized as the total of all maladaptive traits, precluding the need for a separate assessment of Criterion A. This approach corresponds well to hierarchical models of the covariance structure of maladaptive personality features (Sharp et al., 2015; Wright et al., 2011; 2016). There are two potential problems with this approach. First, it would lose an important distinction between personality pathology severity and traits, namely that severity tracks dynamically with clinical functioning whereas traits stay relatively stable (Hopwood et al., 2011; Wright et al., 2016). Second, the definition of personality pathology becomes purely psychometric, in the sense that severity would be defined in a quantitative way without regard to traditional concerns for content validity (i.e., Loevinger, 1957). To the degree that many forms of psychopathology will likely be related to generalized personality severity, this may

not provide a firm conceptual basis for distinguishing personality pathology from other forms of mental health problems.

The approach taken in the DSM-5 Alternative Model for PD diagnosis, as embodied in the LPFS, is for Criterion A assessment to focus on core dysfunction, without emphasizing distinctions between ostensible dimensions of personality functioning as if they are entirely distinct from the dimensions of personality traits. Thus, for example, the LPFS rating involves a single number indicating an overall level of core personality pathology. With respect to the LPFS-SR, this means focusing on the total score rather than emphasizing component scores. The strong intercorrelations among the components and relatively similar correlations to external variables suggests that little information is lost by focusing interpretation of the LPFS-SR at the total score level. What information was lost could likely be recaptured by an assessment of Criterion B traits in the alternative model system. For instance, traits like Negative Affectivity are more likely to capture internal or self-related problems, whereas traits like Antagonism are more likely to capture external or interpersonal-related problems.

Future work should focus on comparing these different possible solutions to this problem in terms of parsimony, the ability to develop valid assessment tools, and clinical utility. Research is also needed to further evaluate the validity of the LPFS-SR specifically. The primary limitations of this study were that all instruments were self-report questionnaires and all subjects were sampled from the community via crowdsourcing. It would be useful to examine alternative methods such as informant reports and diagnostic interviews, and to sample individuals in a range of settings, with particular focus on clinical and forensic populations.

In conclusion, this paper supports the validity of a new self-report measure that corresponds directly to the DSM-5 alternative model Criterion A, and provides some useful insights regarding how to move toward an increasingly valid and parsimonious model for personality diagnosis. The *Levels of Personality Functioning Scale – Self Report* (Morey, 2017) is a reliable and valid marker of personality pathology severity that correlates significantly with a wide range of maladaptive personality features. It provides a useful, freely available assessment tool for assessing personality pathology severity in clinical practice and research.

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LPFS-SR 32

Table 1. *Means, Standard Deviations, and Intercorrelations of LPFS-SR dimensions across three samples.*

	M	SD	Self	Other	Identity	Self-Direction	Empathy	Intimacy
Total	244.94	73.42	.97	.95	.92	.92	.89	.92
Self	137.22	41.89		.83	.96	.94	.79	.81
Other	107.95	34.88			.79	.80	.94	.97
Identity	81.39	23.91				.81	.74	.77
Self-Direction	55.95	20.13					.77	.77
Empathy	41.05	14.09						.83
Intimacy	66.92	22.27						

Table 2. *Correlations of LPFS-SR variables with normal range personality traits.*

	Total	Self	Other	Identity	Self-Direction	Empathy	Intimacy
Neuroticism	.60	**.67**	.47	**.68**	.53	.37	.49
Extraversion	-.38	**-.41**	-.28	-.38	-.37	-.23	-.31
Conscientiousness	-.52	**-.55**	-.39	-.50	**-.60**	-.36	-.40
Openness	-.35	-.30	-.37	-.26	-.37	-.37	-.32
Agreeableness	-.55	-.48	**-.58**	-.46	-.46	-.55	**-.56**

Note. Bold indicates the largest correlations within the same level of the LPFS-SR that are ≥ |.10| larger than the next strongest correlation. Validating variables are ordered according to their relative associations with LPFS-SR scales.

Table 3. *Correlations of LPFS-SR dimensions with maladaptive personality traits.*

	Total	Self	Interpersonal	Identity	Self-Direction	Empathy	Intimacy
CAT-PD							
Affective Lability	.67	**.69**	.57	**.70**	.60	.49	.57
Relationship	.70	.69	.63	.70	.60	.52	.65
Insecurity							
Depressiveness	.63	**.67**	.51	.68	.59	.41	.54
Anxiousness	.57	**.61**	.46	**.64**	.49	.38	.48
Anger	.61	.60	.56	.61	.50	.49	.56
Anhedonia	.63	.63	.54	.60	.59	.44	.55
Peculiarity	.52	.52	.47	.54	.44	.40	.47
Health Anxiety	.51	.51	.46	.53	.44	.39	.47
Fantasy Proneness	.46	**.49**	.39	**.51**	.39	.37	.38
Social Withdrawal	.51	.50	.46	.49	.42	.37	.49
Emotional	.50	.49	.44	.47	.45	.39	.44
Detachment							
Irresponsibility	.61	**.64**	.50	.55	**.67**	.45	.50
Cognitive Problems	.66	**.70**	.53	.66	.67	.50	.51
Non-Perseverance	.60	**.65**	.48	.59	.63	.43	.48
Submissiveness	.59	**.63**	.49	.59	.61	.47	.47
Unusual Experiences	.59	.57	.56	.50	.59	.54	.53
Self-Harm	.58	.58	.51	.53	.57	.44	.51
Non-Planfulness	.47	.49	.40	.40	**.55**	.41	.37
Norm Violation	.44	.42	.43	.36	.45	.41	.41
Risk Taking	.31	.31	.31	.26	.35	.32	.28
Hostile Aggression	.61	.55	.62	.48	.57	.60	.58
Callousness	.54	.45	**.60**	.39	.49	.59	.56
Grandiosity	.50	.41	**.57**	.36	.42	.55	.53
Manipulativeness	.54	.51	.54	.45	.53	.53	.50
Rigidity	.48	.40	**.52**	.38	.37	.50	.49
Rudeness	.49	.46	.50	.43	.44	.49	.46
Unusual Beliefs	.47	.42	.48	.37	.45	.47	.46
Exhibitionism	.19	.16	.22	.14	.19	.26	.19
Mistrust	.62	.55	.63	.59	.46	.55	.62
Domineering	.38	.32	**.43**	.31	.30	.41	.41
Romantic Disinterest	.28	.26	.30	.21	.30	.25	.31
Perfectionism	.17	.12	**.22**	.19	.03	.18	.22
Workaholism	.08	.04	.13	.08	.00	.12	.13
PID-5							
Depressivity	.71	**.75**	.60	.74	.69	.54	.59
Perseveration	.70	.71	.62	.69	.66	.58	.61
Anhedonia	.66	**.68**	.57	.67	.63	.51	.57
Anxiousness	.57	**.61**	.45	**.66**	.49	.40	.46
Emotional Lability	.62	**.65**	.53	.66	.57	.49	.53
Eccentricity	.63	.64	.57	.64	.56	.54	.55

Hostility	.64	.61	.62	.62	.54	.57	.61
Separation Insecurity	.58	.60	.51	.59	.55	.48	.50
Submissiveness	.41	**.46**	.32	.47	.40	.32	.31
Perceptual Dysregulation	.74	.74	.69	.69	.72	.67	.65
Irresponsibility	.71	.70	.65	.64	.70	.63	.62
Distractibility	.66	**.70**	.55	.66	.67	.53	.53
Impulsivity	.61	.62	.54	.56	.63	.54	.51
Callousness	.69	.62	**.72**	.56	.63	.70	.69
Unusual Beliefs	.61	.57	.59	.55	.55	.57	.57
Deceitfulness	.59	.56	.58	.52	.55	.56	.56
Attention Seeking	.41	.39	.40	.35	.39	.40	.39
Risk Taking	.20	.18	.21	.13	.21	.21	.20
Suspiciousness	.63	.57	.65	.59	.49	.59	.65
Withdrawal	.57	.53	.58	.53	.46	.50	.59
Intimacy Avoidance	.53	.47	.55	.43	.47	.51	.55
Grandiosity	.38	.30	**.44**	.27	.31	.42	.43
Restricted Affectivity	.41	.37	.42	.32	.38	.41	.41
Rigid Perfectionism	.41	.38	.41	.40	.32	.38	.41
Manipulativeness	.34	.30	.36	.29	.30	.34	.36

Note. Bold indicates the largest correlations within the same level of the LPFS-SR that are ≥ |.10| larger than the next strongest correlation. Validating variables are ordered according to their relative associations with LPFS-SR scales.

Table 4. *Correlations of LPFS-SR dimensions with personality disorder variables.*

	Total	Self	Interpersonal	Identity	Self-Direction	Empathy	Intimacy
Borderline	.74	.74	.66	.73	.68	.62	.65
Passive-Aggressive	.70	.70	.63	.70	.63	.60	.62
Avoidant	.61	**.63**	.53	.66	.52	.47	.54
Schizotypal	.64	.60	.62	.61	.53	.58	.60
Depressive	.46	**.51**	.36	.56	.39	.32	.37
Obsessive-Compulsive	.43	.42	.39	.44	.36	.36	.39
Dependent	.69	**.71**	.61	.68	.68	.59	.58
Narcissistic	.60	.54	.62	.52	.52	.61	.59
Antisocial	.59	.56	.57	.51	.57	.57	.54
Histrionic	.50	.47	.48	.44	.47	.49	.45
Schizoid	.55	.48	.57	.45	.48	.52	.57
Paranoid	.53	.47	.55	.50	.39	.51	.55

Table 5. *Correlations of LPFS-SR dimensions with interpersonal circumplex variables.*

	Total	Dominance	Warmth
Problems			
Total	.74	.01	-.17
Self	.74	-.05	-.11
Interpersonal	.68	..08	-.22
Identity	.71	-.09	-.11
Self-Direction	.69	-.01	-.10
Empathy	.65	.09	-.15
Intimacy	.66	.07	**-.26**
Sensitivities			
Total	.36	-.28	.32
Self	.34	-.24	.26
Interpersonal	.36	-.30	.35
Identity	.37	-.16	.22
Self-Direction	.27	-.31	.29
Empathy	.33	-.32	.32
Intimacy	.35	-.27	.35
Values			
Total	.45	-.10	-.50
Self	.42	-.17	-.45
Interpersonal	.46	.00	-.52
Identity	.44	-.17	-.38
Self-Direction	.35	-.16	-.49
Empathy	.42	-.03	-.50
Intimacy	.45	.01	-.49
Efficacies			
Total	-.29	-.08	-.49
Self	-.30	-.14	-.46
Interpersonal	-.26	.01	-.49
Identity	-.27	-.17	-.45
Self-Direction	-.31	-.09	-.42
Empathy	-.25	.01	-.45
Intimacy	-.24	.01	-.48