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Article in *World psychiatry: official journal of the World Psychiatric Association (WPA)* · September 2025

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The validity, reliability and clinical utility of the Alternative DSM-5 Model for Personality Disorders (AMPD) according to DSM-5 revision criteria

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A substantial body of empirical evidence has accumulated over the last 12 years since the publication of the Alternative Model for Personality Disorders (AMPD) in the DSM-5. As yet, this evidence has not been organized and reported using the criteria required by the American Psychiatric Association (APA) for proposals submitted to revise the DSM-5. These criteria are based on the Kendler-Kupfer update and expansion of the classic Robins-Guze criteria for establishing psychiatric diagnostic validity. We have been invited by the APA to undertake a review of the last decade of research on the AMPD and to propose a revised, simplified version of the model informed by this evidence. Here we present the findings of the review and our recommendations for the revision of the model. We begin with a brief reiteration of the background and rationale for the AMPD, followed by a description of the revision criteria required by the APA. We then summarize the evidence in support of the AMPD using the required framework. Our review indicates that AMPD-defined personality disorder (PD) shows similar patterns of associations as have been demonstrated for categorical PD diagnoses in terms of antecedent, concurrent and predictive validators. Head-to-head comparisons between AMPD-defined PD and categorical diagnoses suggest a more precise characterization of personality pathology by the AMPD. In addition, AMPD-defined PD appears to show higher reliability estimates than categorical PDs, and strong clinical utility, often outperforming categorical PD diagnoses. We conclude that the AMPD is ready for inclusion in the main section of the DSM. Recommendations are made for: a) further streamlining the AMPD in light of the last decade of accumulated evidence, and b) future research directions in areas where evidence is lacking or more limited.

Key words: Alternative Model for Personality Disorders (AMPD), DSM-5, categorical personality disorders, antecedent validators, concurrent validators, predictive validators, reliability, clinical utility

(*World Psychiatry* 2025;24:319–340)

In 2007, the DSM-5 Task Force convened the Personality and Personality Disorder Workgroup, charged with revising the DSM-IV chapter on personality disorders (PDs) and given a free hand to do so. The Workgroup members quickly came to the decision to develop a dimensional model for PD diagnosis, based on the growing consensus that the categorical diagnostic approach had stifled progress in the understanding and treatment of psychiatric disorders in general and PDs in particular^{1–3}.

However, despite the Workgroup's best efforts and the Task Force's support to develop a dimensional diagnostic system, the American Psychiatric Association (APA) Board of Trustees voted in December 2012 to reject the proposed model for inclusion in the DSM's main Section II. The dimensional model (named the Alternative DSM-5 Model for Personality Disorders, AMPD) was instead placed in a new Section III for "Emerging Measures and Models".

The reasons for this decision were complex, and have been described as "a story of shifting expectations, conflicting goals, and fractured alliances"⁴. However, the rejection appeared to be at least partly attributable to incompatibilities between the Workgroup's efforts and the criteria delineated by the APA's Scientific Review Committee (SRC). Indeed, although the development of the AMPD was grounded in considerable scientific evidence, accumulated over decades, it did not align readily with the type of evidence required by the SRC. According to this framework, which still governs the structure and organization of evidence for proposals submitted for revising the DSM-5, scientific evidence must be

organized according to the well-established Robins and Guze criteria⁵ for psychiatric nosology.

Since the publication of the AMPD in 2013, a substantial amount of research on the model has accumulated^{6–19}. However, this research is yet to be organized according to the APA revision criteria to align with the SRC framework. Importantly, the DSM-IV's PD system has also not been evaluated in terms of these criteria. Against this background, in 2024, the authors of this paper, in addition to several other clinical scientists (see Acknowledgements) were invited by the APA Steering Committee to undertake a fresh review of the accumulated literature on the AMPD for evaluation of possible inclusion in Section II of the DSM-5, and to propose any necessary revisions of the model.

The goal of this paper is to present the findings of the review and to make recommendations for a revised, simplified version of the AMPD informed by the review. We begin with a brief outline of the background and rationale for the AMPD, followed by a description of the revision criteria employed by the SRC. We then summarize the evidence in support of the AMPD using the SRC framework.

We demonstrate that the AMPD is ready for inclusion in the main section of the DSM-5 according to the criteria used by the APA to adjudicate decisions over major changes in the diagnostic system. We conclude with a set of recommendations for: a) potential amendments to the current AMPD in light of the last decade of accumulated evidence, and b) future research directions in areas where we considered evidence to be lacking or of low quality.

BACKGROUND AND RATIONALE FOR THE AMPD

The DSM-5's AMPD represents a paradigm shift away from the traditional categorical model in favor of a dimensional approach in PD classification. Dimensional systems such as the AMPD were developed based on several important research findings²⁰⁻²⁷: a) significant heterogeneity exists within specific PDs, such that two individuals who meet criteria for a given PD may have very different clinical presentations; b) there are high levels of comorbidity (and/or overlap) among purportedly distinct PDs, such that individuals who meet criteria for one specific PD will likely meet criteria for two or more other PDs, calling into question the discrete nature of specific PDs; c) very few unique antecedents, correlates or consequences have been identified for any specific PD, while these are typically shared by other PDs and frequently co-occurring common mental disorders such as depression, anxiety and substance use disorders; d) low inter-rater reliability has consistently been demonstrated for the majority of categorically defined PDs (for instance, the median kappa for specific PD diagnoses has been shown to be 0.35, and the kappa between interview and questionnaire diagnoses is around 0.29)^{28,29}; e) meta-analytic evidence of quantitative studies calls into question the structural integrity of the DSM-IV ten discrete PD syndromes³⁰, and emerging evidence indicates that PD manifestations may be better represented by a general factor of personality dysfunction that captures the shared variance of all PD manifestations plus trait dimensions that capture unique variance^{31,32}; and f) there is no evidence supporting existing diagnostic thresholds for specific PDs – that is, diagnostic thresholds (e.g., five out of nine criteria for Borderline PD) do not actually demarcate the presence versus absence of disorder; rather, they are arbitrary thresholds along a continuum of prototypicality and level of impairment^{20,22}.

To address these limitations, the AMPD utilizes a more parsimonious conceptualization of personality pathology that accounts for heterogeneity within disorder and comorbidity to increase the validity, reliability and clinical utility of PD diagnosis. Accordingly, a single underlying severity continuum shared by all PDs defines core personality pathology. This underlying unidimensional severity criterion is called the Level of Personality Functioning (LPF; Criterion A of the AMPD), defined as impaired self and interpersonal functioning. LPF is rated on a 5-point scale from healthy/typical (=0) to severely impaired (=4), with a rating of 2 or more indicating personality dysfunction³³.

Apart from offering for the first time in the history of the DSM a psychiatric construct that is truly dimensional, ranging from typical to atypical, the LPF provides parsimony by eliminating the need for ten overlapping PDs which, as discussed, have been shown to have multiple problematic features. In so doing, the LPF also eliminates the need for Personality Disorder Not Otherwise Specified, which research has shown to be the most diagnosed PD, because real-life patients tend not to fit neatly into any of the ten categories³⁴, and clinicians have limited time for diagnosis.

After determination of the individual's LPF, the next step in the dimensional diagnostic process is evaluation of the pathological severity across five trait domains (Criterion B of the AMPD), to

describe the ways in which the individual's self and interpersonal dysfunction are manifested. In the AMPD, these five trait domains include Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism. A third diagnostic step in the AMPD allows the clinician to map the combination of Criterion A and B features onto traditional PD criteria. However, this step has been viewed as redundant, because the LPF and trait domains have been shown to provide full coverage of all PDs^{13,35-39}.

Overall, the combination of determining a patient's LPF in a first step and assignment of trait manifestation in a second step allows for the assessment of a patient's capacities for adaptive self and interpersonal functioning, and a distinction of how such functioning expresses itself in that particular patient. Two patients may, for instance, both be assigned an LPF score of 3, but one of them may show high levels of Impulsiveness and Disagreeableness (e.g., the patient frequently gets into fights), whereas another may show high levels of Detachment and low levels of Impulsiveness and Disagreeableness (e.g., he is a loner who avoids contact with others and leads a restricted life). In this way, the AMPD addresses heterogeneity within and comorbidity among different PD manifestations, thereby providing a more valid and clinically useful approach for characterizing personality pathology.

Indeed, since the publication of the AMPD in 2013, several reviews on the structural, concurrent and predictive validity, reliability and clinical utility of this model have been published⁶⁻¹⁹. However, the integration of the last 12 years of empirical evidence in support of the dimensional approach mainly followed conventions for evaluating construct validity^{40,41}, whereas APA revision criteria require a different set of standards, as described below.

THE ROBINS-GUZE / KENDLER-KUPFER CRITERIA FOR THE VALIDITY OF PSYCHIATRIC DISORDERS

By virtue of its grounding in medicine, the constructs of interest in psychiatry are necessarily *diagnostic* constructs, which immediately introduces a constraint in how they must be conceptualized in relation to the clinical utility requirement – that is, a psychiatric construct must be able to tell us whether a person suffers from a disease or not. In medicine, this is a prerequisite, because the diagnosis serves as the gateway to whether and which treatment might be indicated.

To assess whether a psychiatric construct can identify who suffers from disease, psychiatry has relied, for the last 50 years, on five principles proposed by Robins and Guze⁵. These principles reflect five types of research studies, each aimed at capturing a specific component of a disorder's nosology.

The first type are clinical description studies, aiming to demonstrate that the disorder has a particular and consistent pattern of symptoms and that these symptoms co-occur. The goal of these studies is to develop a coherent clinical picture of the disorder. Therefore, important non-psychopathological features that are common or prototypical of clinical presentations of the disorder must be identified in these studies, including for instance sociodemographic correlates such as age, sex, and age of onset. The

Table 1 American Psychiatric Association's criteria for proposed DSM-5 revisions

Validators	
Antecedent validators	<ul style="list-style-type: none">• Environmental risk factors• Prior psychiatric history• Familial aggregation and/or co-aggregation (i.e., family, twin or adoption studies)• Sociodemographic and cultural factors
Concurrent validators	<ul style="list-style-type: none">• Cognitive, emotional, temperament and personality correlates (unrelated to the diagnostic criteria)• Biological markers, e.g., molecular genetics, neural substrates• Patterns of comorbidity• Degree or nature of the functional impairment
Predictive validators	<ul style="list-style-type: none">• Diagnostic stability• Course of illness• Response to treatment
Reliability	
	<ul style="list-style-type: none">• Inter-rater reliability• Test-retest reliability• Internal consistency
Clinical utility	
	The degree to which the proposed changes:
	<ul style="list-style-type: none">• do not alter caseness• improve user acceptability• improve clinicians' ability to apply the diagnostic criteria accurately and adherence to practice guidelines• improve clinical outcomes• improve the clinician's ability to select the best treatment or determine prognosis• do not introduce unwanted negative consequences

second type are laboratory studies, that focus on identifying neurobiological and physiological substrates of the disorder, and are generally viewed as more empirically valid compared to clinical descriptive studies, given the external validity evidence that they presumably provide.

The third type are studies that delimitate the disorder from other related syndromes. These studies support the discriminant validity of the construct with the aim to establish its uniqueness relative to other psychiatric disorders with similar phenotypic presentations. The fourth type are follow-up studies that demonstrate a prototypical course and outcome of the symptoms. For example, demonstrating that individuals who were first identified with the disorder in baseline assessments present with the same disorder (as opposed to a different psychiatric disorder) in later assessments provides evidence for the original diagnostic criteria utilized at baseline. The fifth type are studies that aim to identify a familial and potentially genetic basis of the disorder. Demonstrating that the disorder displays significant heritability (through research designs that can separate genetic from environmental effects, such as twin studies) provides evidence for distinct psychopathological processes related to its phenomenology, and thus confirms the validity of the construct.

Fifty years later, the Robins and Guze criteria are still considered the gold standard approach for establishing the validity of

psychiatric disorders. Indeed, these criteria informed what came to be known as the Kendler-Kupfer criteria, used by the then newly established SRC to evaluate the readiness of the AMPD for adoption into Section II. These criteria were outlined in a 2009 document entitled "Guidelines for making changes to DSM-V"⁴², and still form the basis of the current APA guidelines for submitting proposals for making changes to the DSM-5 (see Table 1). In what follows, we provide an updated review of the literature evaluating the validity of the AMPD using these criteria.

The APA guidelines describe different types of proposals for changes to DSM-5 diagnostic criteria. Type 1 proposals involve changes to existing criteria to improve reliability and validity, and must demonstrate superiority of the proposed system over the existing one in head-to-head comparisons. Type 2 proposals involve addition of a new diagnostic category or specifier and require demonstration of validity, reliability and clinical utility in the absence of comparison with existing systems. The AMPD represents both Type 1 and Type 2 changes. Therefore, in our review, we provide evidence for the AMPD's validity, reliability and clinical utility according to the APA guidelines, as well as evidence in support of the AMPD's superiority over Section II's diagnostic categories in head-to-head comparisons.

VALIDITY

Table 2 summarizes Type 1 and Type 2 evidence in terms of antecedent, concurrent and predictive validators of AMPD, taking into account its strength.

Antecedent validators

Environmental antecedents

Strong evidence supports associations between childhood trauma and/or maltreatment and LPF⁴³⁻⁵¹. Moderately strong evidence supports a link between poor parental bonding and/or closeness and LPF⁵²⁻⁵⁴. In addition, there is some evidence for an association of bullying victimization⁵⁵ and parental discord⁵⁶ with LPF.

This research is consistent with well-established developmental models for PD which indicate that the early caregiving and family environment is particularly important for the development of healthy personality functioning. Given the overlap between LPF and other measures of maladaptive self and interpersonal functioning, it is reasonable to assume that the mass of data available on environmental antecedents for the development of self-concept, self-esteem, self-appraisal, self-monitoring, self-directedness, moral decision-making, identity coherence, empathy, mentalizing, perspective-taking, and quality of relationships is also relevant⁵⁷⁻⁶⁰.

Strong evidence across nine studies^{54,61-68} supports a relation of a measure of AMPD Criterion B traits, the Personality Inventory for DSM-5 (PID-5)⁶⁹, with childhood trauma and maltreatment. Studies indicate that emotional (rather than physical or sexual) traumatic experiences are particularly associated with high levels of trait

Table 2 Summary of the evidence concerning the Alternative DSM-5 Model for Personality Disorders (AMPD) validity

	Basic evidence evaluation (Type 2)		Head-to-head superiority evaluation (Type 1)		
	LPF	Traits	LPF	Traits	LPF + Traits
Antecedent validators					
Environmental risk factors					
Poor maternal bonding or parental closeness	++	+	+		
Childhood trauma/maltreatment	+++	+++			
Bullying	+				
Parental discord	+				
Temperament	++	+++			
Psychiatric history	++	+			
Familial aggregation and/or co-aggregation		+++		++	
Concurrent validators					
Sociodemographic factors					
Invariance across genders	++	+++			
Mean differences according to sex assigned at birth	+++	++			
Mean differences for gender/sexual minorities		+			
Invariance across age groups	++	++			
Invariance across cultural groups	+	+++			
Cognitive correlates					
Social cognitive impairment	+++		+		
Cognitive distortions	++	++			
Executive functioning impairment	+	++			
Emotional correlates					
Emotion dysregulation	++	+++			
High levels of negative affect	++				
Alexithymia	+	+			
Emotional empathy	+	+			
Temperamental correlates	+	+++			
Convergent validity with similar constructs					
Self functioning	+++				
Interpersonal functioning	+++			+++	
Extreme traits		+++		+	++
Section II PD correlates	+++	+++	++	++	++
Patterns of comorbidity					
Anxiety disorders	++	+++			
Mood disorders	++	+++			
Post-traumatic stress disorder	++				
Conduct disorder	+	+++			
Substance use disorders	++	+++			
Psychosis		++			
Attention-deficit/hyperactivity disorder		+			
Psychosocial dysfunction	+++	+++	++	++	++
Pathophysiology, neurobiology		++			

Table 2 Summary of the evidence concerning the Alternative DSM-5 Model for Personality Disorders (AMPD) validity (*continued*)

	Basic evidence evaluation (Type 2)		Head-to-head superiority evaluation (Type 1)		
	LPF	Traits	LPF	Traits	LPF + Traits
Predictive validators					
Treatment response					
Treatment satisfaction and rapport	+				
Improved symptoms	+++	+++	++	+++	+++
Dropout	++	+	+		+
Diagnostic stability and course of illness	+++	+++			

+++ means that the finding was replicated in at least five studies; ++ means that the finding was reported at least twice; + means some evidence for the effect; Type 1 studies are those in which head-to-head comparisons are made between existing and new/proposed criteria sets; Type 2 studies do not require head-to-head comparisons, but simply require evidence that validity, reliability and clinical utility criteria are met. PD – personality disorder, LPF - Level of Personality Functioning.

scores, with Psychoticism and Detachment showing the strongest effect sizes. These findings fit with known research indicating that dissociation and detachment are prominent post-traumatic and trauma-coping mechanisms. In addition, one study shows a link between retrospective parental invalidation and PID-5 trait scores⁵⁴.

In terms of head-to-head comparisons, only one study reports data directly comparing antecedent environmental validators between Section II PDs and LPF⁵². In this study, maternal bonding during infancy predicted later LPF, but not Borderline PD symptom count.

Temperament as antecedent

Developmental models indicate that extreme levels of trait expression during childhood and adolescence confer vulnerability for emergence of PD. Two prospective follow-up studies demonstrate this to be true for LPF. In a combined sample of community and clinical youth, Vanwoerden et al⁷⁰ showed that high levels of temperamental trait expression in early adolescence prospectively predicted interpersonal problems in middle adolescence, culminating in maladaptive self functioning in early adulthood. Moreover, in a sample of 101 mother-child dyads recruited from obstetric units, Fleck et al⁵² demonstrated that high levels of novelty seeking and low levels of harm avoidance at age 5 predicted Level of Personality Functioning Scale - Brief Form 2.0 (LPFS-BF 2.0)⁷¹ scores at age 14.

We are not aware of studies that show a prospective association between early temperament and later AMPD-defined maladaptive trait scores *per se*. However, a robust literature exist documenting prospective links between early temperament and later similar personality traits⁷².

Prior psychiatric history as antecedent

Moderate evidence supports prior psychiatric history as an antecedent validator for LPF^{73,74}. Using both the Structured Clinical

Interview for the DSM-5 Alternative Model for Personality Disorders (SCID-5-AMPD) Module 1⁷⁵ and the Structured Interview of Personality Organization (STIPO)⁷⁶, Kampe et al⁷³ demonstrated that higher levels of personality dysfunction correlated with number of prior psychiatric hospitalizations, suicide attempts, and prior psychiatric diagnosis. In addition, a study using the Levels of Personality Functioning Scale (LPFS)⁷⁷ and the AMPD Clinician Rating Form (CRF)⁷⁷ found that self-reported past psychiatric hospitalization was associated with greater impairments across all four LPF domains as well as the trait domains of Detachment and Negative Affectivity⁷⁴.

Familial aggregation and/or co-aggregation

As yet, no twin or adoption studies have been conducted with measures of LPF. However, there are data using twin and adoption methodologies for evaluating the genetic basis of components of LPF, such as self-esteem, empathy, and interpersonal functioning⁷⁸⁻⁸⁰.

Concerning AMPD traits, a study conducted in a population-based sample of Norwegian twin pairs found that the heritability estimates for Negative Affectivity, Detachment and Disinhibition ranged from 0.26 to 0.37⁸¹.

Two studies provided a head-to-head comparison of Section II PDs vs. AMPD heritability estimates. In a Norwegian population-based sample of 1,408 adult twins, Reichborn-Kjennerud et al⁸² estimated overlap in genetic and environmental risk factors for Section II PDs and maladaptive ends of trait domains assessed by the PID-5 Norwegian Brief Form 5 (PID-5-Norwegian-BF 5)⁶⁹ at two time points spanning a 10-year period. Results showed that, when measured concurrently, an average 81% of genetic variance was shared between the maladaptive-end trait domains and Paranoid, Schizotypal, Antisocial, Borderline and Avoidant PDs. For Obsessive-Compulsive PD, 43% of the genetic variance was shared. Genetic correlations between the individual maladaptive-end trait domains and PDs ranged from +0.21 (Detachment with Antisocial PD) to +0.91 (Negative Affectivity with Paranoid PD). When measured longitudinally, an average 54% of genetic vari-

ance was shared between the maladaptive-end trait domains and nine of the Section II PDs with, again, the exception being Obsessive-Compulsive PD, which shared only 28% of the genetic variance. The authors concluded that maladaptive trait domains tap, at an aggregate level, the same genetic risk factors as the DSM-5 Section II classification for most of the PDs.

A similar study measured Five-Factor Model personality traits, which reflect the healthy end of the PID-5 domain traits⁸³. When assessed concurrently, the shared genetic variance of the traits to six of the Section II PDs was 58%. With a 6-to-12 year interval, the median shared variance was 36%.

Summary of antecedent validators

Moderate to strong evidence indicates that LPF and AMPD traits show similar antecedent validators as the PD categories in terms of environmental and temperamental antecedents and prior psychiatric history, as well as – in the case of traits – shared genetic variance. Given associated costs, more longitudinal and genetic studies will likely be pursued if and when the AMPD is fully implemented in Section II. We note that antecedent validators are mostly unstudied for current Section II PD categories, with the exceptions of Borderline and Antisocial PDs.

Concurrent validators

Sociodemographic correlates and cultural factors

The results of invariance testing studies for gender show no bias across sex assigned at birth, confirming that the examination of mean differences across sex is valid for both LPF⁸⁴⁻⁸⁶ and maladaptive traits⁸⁷⁻⁹⁰.

Studies on sex assigned at birth provide no evidence of mean differences between women and men in community or clinical samples for LPF (there were some small differences at the subcomponent level, where women were shown to have higher scores in self-dysfunction compared to men^{91,92}).

Sex differences have been observed for mean maladaptive trait scores, with the most consistent findings revealing higher levels of Negative Affectivity in adult females and higher scores on Antagonism in adult males⁸⁴. Mean differences have been observed for sexual and gender minorities, who show higher mean scores across all maladaptive trait domains (with the exception of non-significant differences on Detachment in a clinical sample) than heterosexual individuals⁹³. However, this should be interpreted with caution, given evidence of criterion bias that may make it easier for sexual and gender minority individuals to endorse criteria⁹⁴.

Extant research evaluating potential bias in test items for personality functioning^{84,86,95} and maladaptive trait domains⁹⁶ shows no bias in terms of assessment across age groups when evaluating adolescents and adults. A recent study found differential item functioning of AMPD measures for older adults⁹⁷. Specifically, 18 of 80 items on the Level of Personality Functioning Scale - Self-

Report (LPFS-SR)⁹⁸ and all five maladaptive trait domains demonstrated large differential item functioning, with Psychoticism (100% of items) most affected. These findings need replication, and more work may be needed to understand the effects of old age on response patterns for AMPD measures.

The cross-cultural validity of the LPFS-BF-2.0⁷¹ was evaluated in a large population-based study of adults in Canada, Spain and Belgium, demonstrating invariance among Dutch, English, French and Spanish versions of the measure⁸⁴. Similar research has been conducted for maladaptive trait domains^{18,84,99-102}, suggesting the cross-cultural validity of measures of traits across different countries, cultures, languages and racial groups. Slight variations depending on the level of individualism vs. collectivism have been noted, in that some cultures encourage the development of distinct attitudes, self-definition, and striving to attain personal goals more than other cultures^{102,103}.

Although we are not aware of head-to-head comparisons for Section II- and III-related sociodemographic and cultural factors, studies of the ten categorical PDs have suggested bias in terms of sex, race, culture, and age in criteria^{101,104-106}.

Cognitive correlates

Strong evidence indicates that LPF is associated with social-cognitive impairment. Two studies have found that higher LPF scores associate with lower mentalizing capacity: one measured LPF by the Semi-Structured Interview for Personality Functioning DSM-5 (STiP-5.1¹⁰⁷)¹⁰⁸, and the other by self-report¹⁰⁹. Two studies (one in an adult¹⁰⁹ and the other in an adolescent⁸⁶ sample) demonstrated that higher LPF is associated with lower self-reported reflective functioning. A study in adolescents found anomalies in social (but not monetary) reward processing¹¹⁰.

Strong evidence supports a link between LPF and cognitive distortions, including early maladaptive schemas¹¹¹, deficits in cognitive components of empathy¹¹², daily-level distorted fortune telling (e.g., catastrophic predictions of the future), executive functioning and problem-solving difficulties, lower self-awareness^{113,114}, and lower levels of cognitive reappraisal¹¹⁵.

Studies of the cognitive correlates of PID-5⁶⁹ maladaptive traits show moderate evidence for correlations with executive functioning, with one study suggesting that 73.3% of 30 PID-5 scales show correlations of 0.30 and higher for executive functioning tasks¹¹⁶, and another demonstrating larger effect sizes for the domains of Negative Affectivity and Disinhibition¹¹⁷.

Other cognitive factors that have been evaluated include cognitive distortions. Specifically, Detachment was shown to be associated with reduced truth bias in deception detection task, suggesting a protective role for Detachment in high-deception-frequency environments¹¹⁸. Negative Affectivity, Disinhibition and Psychoticism were significantly associated with difficulties in daily thinking (e.g., problem-solving¹¹³), and several maladaptive traits moderated the associations between daily-level cognitive distortions and LPF¹¹⁴. Finally, maladaptive trait domains have been linked with deficits in cognitive empathy¹¹².

One head-to-head comparison study of LPF versus Borderline PD demonstrated that both of them were associated with alterations in social (but not monetary) reward processing in adolescents, but that alterations in social reward were better predicted by LPF than by borderline traits¹¹⁹.

Emotional correlates

At least six studies indicate strong evidence for emotion dysregulation problems associated with LPF, including distress intolerance^{109,120} and maladaptive shame-coping¹²¹. Some evidence indicates links between LPF and higher levels of daily negative affect^{120,122}, alexithymia⁸⁶, and deficits in emotional empathy¹¹².

Studies of maladaptive traits have typically focused on emotion dysregulation as a correlate, and have primarily been conducted in non-clinical college student and online samples (though at least one study was conducted in a clinical sample¹¹²). In one study, emotion dysregulation showed a direct relation with the PID-5 total score, mediated by identity disturbance¹²³. In another study, emotional dysregulation, as a transdiagnostic factor, was shown to mediate the relation between maladaptive traits and emotional disorders (anxiety, depression and stress)¹²⁴.

In a large ecological momentary assessment (EMA) study, Antagonism was shown to be associated with impulse-control difficulties and limited access to emotion regulation strategies, and Negative Affectivity, Detachment and Antagonism each moderated individuals' reactions to daily negative interpersonal events, such that the frequency of these events was higher in the presence of higher levels of maladaptive traits¹²⁵.

Another study of a mixed college and clinical sample (90% with a PD diagnosis) found significant associations between maladaptive trait domains and greater dysfunction in emotion dysregulation coping¹²⁶. Finally, studies have also found significant links between maladaptive traits and both alexithymia and deficits in emotional empathy^{112,127}.

Temperament as correlate

Some evidence supports a negative link of LPF with effortful control and emotion regulation, and a positive link with impulsivity¹²⁸. A vast literature provides strong evidence for a link between temperament and basic personality traits¹²⁹. In turn, AMPD traits map onto basic personality traits¹³⁰⁻¹³², further supporting temperament as an important correlate of maladaptive trait scores.

Similar constructs as correlates

The results of 16 studies provide strong evidence that LPF is associated with other measures of maladaptive self functioning^{85,95,98,133-142} and interpersonal functioning^{86,133,134,139,140,142,143}. LPF has also been shown to correlate with measures of borderline personality organization^{85,138,140,144}. These studies are important because

they confirm the argument made earlier that other measures and constructs tapping maladaptive self and interpersonal functioning can be used as stand-ins for LPF, and provide strong evidence that LPF assesses the constructs that it was intended to capture.

Strong evidence supports the convergent and discriminant validity of the PID-5⁶⁹ with other measures of maladaptive traits¹⁴⁵⁻¹⁵⁴. These and other studies have been included in several meta-analyses confirming the high congruence between the PID-5 and measures of the Five-Factor Model of Personality^{15,99,153}.

At least three studies provide moderate support for head-to-head superiority of the AMPD compared to Section II PDs in associations with similar constructs. In a sample of 300 community-based adults, the PID-5⁶⁹ was found to be a better predictor of interview-assessed personality pathology than a Section II PD self-report measure (the Personality Diagnostic Questionnaire-4+, PDQ-4+)¹⁵⁵. In a study of 200 male inmates, the AMPD outperformed Section II Antisocial PD in predicting scores on Hare's Psychopathy Checklist-Revised^{156,157}. In a study of outpatients, the AMPD explained 46% of variance in psychopathy scores, whereas Section II Antisocial PD explained less than half of that variance (22%)¹⁴⁶.

Correlations with Section II PDs

Strong evidence from at least 27 studies supports the conclusion that LPF correlates with traditional Section II PDs, in adults and adolescents. These studies used a variety of LPF measures across clinical and community samples of adults, including the LPFS^{98,157-161}, the STiP 5.1^{107,140}, the SCID-5-AMPD¹³⁸, the LPFS-BF 2.0^{141,162,163}, the LPFS-SR^{164,165}, and the Five-Item Screening Scale for Personality Disorders (FISSPD)⁹⁵. These findings were replicated in samples of adolescents using the STiP-5.1^{142,166,167}, the Levels of Personality Functioning Questionnaire 12-18 (LoPF-Q 12-18)^{135,168-170}, the LPFS-BF 2.0⁸⁵, and the FISSPD¹³⁷. In addition, three studies used proxies for LPF and demonstrated similar correlations with Section II PDs^{120,171,172}.

Demonstrating correlations between LPF and all Section II PDs confirms that the LPF, as intended, is a measure of PD as defined by the traditional categorical system. However, it improves upon the latter by providing a more parsimonious assessment. Whereas evidence supports correlations with individual PDs, several studies also demonstrate associations with total number of PDs¹⁶² or the severity of PD criterion count^{95,98,163,164}. These studies confirm that the LPF, as intended, is a severity continuum indexing general personality dysfunction.

Importantly, studies also show that LPF increments both general psychopathology¹⁶⁸ and general disability¹⁶⁹ in predicting outcomes, indicating that it contains additional information regarding functioning that goes beyond general severity and disability – that is, maladaptive self and interpersonal functioning, the core features of personality dysfunction¹⁷³.

At least 28 studies provide strong evidence for the correlation between PID-5 maladaptive trait domains and Section II PDs^{146,155,157,171,174-198}. Most of this research is summarized in six review papers^{35-39,199}, mirroring the finding by Morey et al³³ of mean dimen-

sional correlations between the two systems of 0.73, with a kappa of 0.54 for categorical diagnoses.

Several head-to-head comparison studies provide moderate evidence for comparability of the AMPD with Section II PDs. One study²⁰⁰ examined whether the AMPD and Section II PD assessments identify the same patients in a sample of 305 psychiatric outpatients and 302 community residents who scored above threshold on a PD screen. Convergence across the two models was good to very good and demonstrated that the AMPD yields essentially the same overall prevalence of Section II PDs (~50% using each model, with a base rate difference of 5.3%) and largely identifies the same overall population (kappa = 0.74).

At least two studies examined how well interview-based ratings of Antisocial PD of both DSM-5 Section II and AMPD predicted either an interview-based measure of psychopathy in sample of prisoners¹⁵⁷ or self-reported measures of psychopathy in a sample of outpatients²⁰¹. In both studies, AMPD traits and impairment predicted psychopathy more strongly than did Section II PD ratings.

Patterns of comorbidity with common mental disorders

Moderate evidence indicates correlations between self-report measures of LPF and measures of anxiety^{146,202}, depression^{146,202,203}, substance use^{158,159,202}, post-traumatic stress disorder^{170,204}, and conduct disorder (in adolescents)¹⁷⁰. Strong evidence also exists for associations with general psychopathology²⁰⁵. Moderate evidence also exists for correlations between LPF and number of comorbid diagnoses^{166,167}, and some evidence indicates greater severity of anorexia nervosa associated with LPF in clinical samples of adolescents²⁰⁶. These patterns are consistent with what is known for traditional PDs⁷⁷.

A substantive research literature supports strong links between maladaptive trait scores and common mental disorders, which lays the foundation for a reformulation of psychopathology in terms of trait variability^{21,207-210}. Consistent with this literature, evidence supports the association between PID-5 scores and mood disorders²¹¹, psychosis²¹²⁻²¹⁴, substance use disorder^{211,215,216}, and attention-deficit/hyperactivity disorder (ADHD)²¹⁷. Some evidence indicates associations between maladaptive traits and proneness to migraine²¹⁸, as well as general psychiatric severity⁸⁹.

Nature and degree of psychosocial dysfunction

At least 28 studies provide strong evidence for the association of LPF with psychosocial dysfunction, including increases in general disability scores; and reductions in physical health^{97,158,219}, general adaptive functioning^{33,140,162,169}, quality of life^{170,220}, life satisfaction²²¹, well-being^{222,223}, and work and social adjustment^{158,224,225}; as well as with pronounced loneliness²²⁶, and discomfort and instability in relationships²²⁷. In a sample of community adolescents, LPF predicted social difficulties and lower well-being and life satisfaction one year later²²⁸.

Several studies show that general psychiatric severity/impair-

ment^{73,146,165,168,217,225,229} and suicide severity and self-harm are correlated with LPF^{166,230}. Notably, a study in clinical adolescents found that the score on the STiP-5.1 significantly predicted suicide attempt in the past year, and that especially the self dysfunction component of LPF explained additional variance in suicidal attempt over and above all psychiatric disorders²³¹. LPF has also been shown to be associated with reduced capacity to meet developmental milestones in adolescents²³².

Some studies point to the self component of LPF as a better predictor of functioning²²⁵ and suicide attempt²³¹ than the interpersonal component. With regard to degree, one study showed that, with each level of LPE, the risk for living alone, being single, being on a disability pension, and having symptom disorders increased, whereas months of working decreased²³³.

Self-report measures of LPF also show correlations with general factors of personality pathology and total severity scores on personality measures^{162,165}, confirming that the LPF captures the general, shared features of personality dysfunction reflected in a unidimensional severity continuum.

Similar correlations have been demonstrated for maladaptive trait domain scores. For instance, one study showed that AMPD trait facets were strongly associated with the Global Assessment of Functioning (GAF) score (intraclass correlation coefficient, ICC between 0.85 and 0.92)²³⁴, and another found that maladaptive trait domains prospectively predicted general psychological distress one year later²³⁵. In addition, a study of young people with first-onset psychosis demonstrated an association between GAF score and Detachment, suggesting that personality traits may be useful correlates of first-onset psychosis²³⁶.

EMA studies have found that maladaptive traits are associated with greater daily aggression (particularly Negative Affect²³⁷), and greater daily levels of interpersonal tension and poorer social connectedness in adolescents²³⁸. A study also found associations between maladaptive trait domains and greater impairments in social and parental relationships, although associations between maladaptive traits and impairments in social relationships became non-significant after controlling for LPF (with a few exceptions)²²⁷.

One study in a sample of 1,377 twins found that maladaptive trait domains were significantly associated with greater loneliness, with evidence of both genetic ($r_g = 0.45-0.75$) and unique environmental ($r_e = 0.10-0.48$) influences²³⁹. Maladaptive traits have also been linked to greater suicidal ideation (Negative Affect, Detachment) and behavior (Detachment, Disinhibition, Psychoticism)²⁴⁰. Finally, in a study of community adolescents, the overall score on the PID-5 predicted social difficulties one year later, and Psychoticism contributed to social rebuff whereas Detachment was associated with lower quality of life²²⁸.

Head-to-head comparison studies provide moderate evidence for the superiority of the AMPD over DSM-5 Section II PDs in its association with psychosocial dysfunction.

In a study on 317 individuals, including a clinical sample of 282 patients of whom 192 were diagnosed with a PD²²⁵, the SCID-5-AMPD Module I was a stronger predictor of scores on the Work and Social Adjustment Scale (WSAS)²⁴¹ and the GAF-Functioning (GAF-F)²⁴² than the sum of DSM-IV PD criteria, with the self com-

ponent providing the strongest predictive power.

A second study compared Section II PDs with the AMPD in explaining concurrent psychosocial functioning levels in 600 psychiatric outpatients and community residents screened as at risk for PD pathology⁷⁴. The AMPD dimensions showed stronger associations with psychosocial difficulties and explained more of their variance compared with the Section II PDs.

In another study with this same sample¹⁹⁵, the two models were compared for their longitudinal predictive power of psychosocial functioning eight months later. Both models predicted functioning outcomes and each added significant predictive power, but the AMPD domains outpredicted the Section II PDs by 2.56%, and the AMPD facets outperformed the Section II PD criteria by 5.31%.

Pathophysiological / neurobiological correlates

A wealth of data is available on the neurobiological and pathophysiological correlates of components of LPF, including identity, self-esteem, self-appraisal, empathy, interpersonal functioning, social exclusion, rejection sensitivity, self-reflective capacity, and mentalizing ability²⁴³. These constructs are most often studied in the Research Domain Criteria (RDoC) systems for social processes – specifically Affiliation and Attachment, Social Communication, Perception and Understanding of Self, and Perception and Understanding of Others, each demonstrating differential convergence of associated brain areas in a meta-analysis²⁴⁴.

Thus, while LPF proper has not been evaluated directly using neurobiological designs, research using these methods on its component parts suggests that, should such studies be conducted, they are likely to validate the LPF also from this perspective.

Some evidence suggests that PID-5 traits provide good coverage of biobehavioral externalizing liability²⁴⁵. A recent systematic review examining the neural correlates of maladaptive traits among individuals with Borderline and Antisocial PDs revealed that greater trait anger/hostility and aggression is associated with alterations in the interplay between subcortical (primarily the amygdala) and prefrontal regions²⁴⁶. Trait impulsivity was associated with alterations in serotonergic and endocannabinoid pathways and abnormalities in fronto-temporal-limbic regions; greater risk-taking was associated with weaker cortico-striatal connectivity.

Summary of concurrent validators

The LPF and maladaptive trait domain measures demonstrate moderate, and in some cases strong, associations with expected concurrent validators. Most studies have focused on validating LPF and maladaptive trait domains through evaluating their convergent validity with other measures of personality pathology, in addition to other measures that tap into maladaptive self and interpersonal functioning, and psychosocial dysfunction. An evidence base is developing for cognitive, emotional and pathophysiological correlates.

Since it is based in personality functioning and trait dimensions rather than categorical diagnoses, and its main components are

transdiagnostic, the AMPD is much more compatible than Section II PDs with the RDoC approach to understanding psychopathology. At least six of the studies reported above have carried out head-to-head comparisons between AMPD and Section II PDs in terms of concurrent validators, all suggesting equivalence or superiority of the AMPD.

Predictive validators

Treatment response

Several prospective studies provide strong evidence for the predictive validity of LPF with regard to treatment response.

One study showed that self-reported LPF predicts treatment satisfaction and rapport with the provider in individuals on treatment for substance use²⁴⁷. In a sample of 191 patients with PD and 91 patients without PD, LPF predicted treatment dropout, with the risk being 2.3 times higher for patients with high LPF scores¹⁶⁰.

In a study of over 1,000 patients in outpatient settings in Norway, 57% had severe level LPF scores (LPFS-BF >18)²³³. From the start to the last phase of evidence-based treatment (mentalization based therapy, dialectical behavior therapy), 64% of the sample presented a score reduction in LPFS-BF. This rate of improvement is higher than that found for Borderline PD in a recent review of treatment response studies²⁴⁸.

In a sample of patients receiving psychodynamic-based psychotherapy and matched controls, participants with higher LPF and maladaptive traits of Negative Affectivity and Psychoticism at baseline were more likely to drop out of therapy²⁴⁹. Additionally, patients' LPF scores declined significantly from baseline to follow-up ($d=0.40$), but were stable in the control group ($d=0.10$). Finally, in a naturalistic follow-up study of adolescent inpatients, a combination of LPF and trait self-report assessment predicted significant reduction in general psychiatric severity scores from admission to discharge²⁵⁰.

Three studies have evaluated treatment response in relation to maladaptive traits. The first demonstrated mean differences in Negative Affectivity between admission and discharge²⁵¹. In the second, Negative Affectivity and Detachment were related to higher admission severity in all four outcome domains (anxiety, depression, somatic symptoms, and psychosocial dysfunction)²⁵². In a third study, participants with higher scores on Negative Affectivity and Psychoticism at baseline were significantly more likely to drop out of psychotherapy²⁴⁹.

A meta-analysis of 207 studies investigated the extent to which personality traits changed as a result of intervention (primarily clinical interventions) and documented that “interventions were associated with marked changes in personality trait measures over an average time of 24 weeks”²⁵³. Negative Affectivity was the primary trait showing change, with an average effect size of 0.69, followed by Detachment, for which the average was 0.38. Changes replicated across experimental and non-experimental designs, for non-clinical interventions, and persisted in longitudinal follow-up. Type of therapy was not strongly associated with the amount of

change in personality traits.

Strong evidence from eight head-to-head comparison studies shows superiority of the AMPD compared to Section II PDs in predictive validity (e.g., for treatment dropout¹⁶⁰). The self components of LPF are particularly predictive.

In two studies of adolescent inpatients, a combination of LPF and trait scores was a better predictor of treatment outcome (overall reduction in psychopathology) compared to a Borderline PD diagnosis^{250,254}. In another study of a treatment-seeking sample of adult participants diagnosed with Section II Borderline PD, AMPD traits captured a more severe variant of the condition and incremented Section II diagnosis as a predictor of reduction in overall psychopathology by the end of treatment²⁵⁵.

In a study of over 600 adults (50% patients) followed in a naturalistic study design, LPF in combination with AMPD Criterion B had greater power than Section II PDs in predicting twenty clinically relevant outcomes over 8 months¹⁹⁵. In another study²⁵⁶ of 311 patients (of whom 50% received past-year mental health treatment), Section II PDs were found to account for little variance in outcomes over and above the AMPD domains/facets, whereas the AMPD facets were generally more predictive of outcomes than the Section II PDs.

A study of 185 psychiatric outpatients found that the PID-5 trait domains predicted more variance and provided significant incremental prediction compared to Section II PDs for three of five areas of clinical dysfunction, and had better model fit for four of the five²⁵⁷. A study of 63 patients with PD found that the two systems yielded comparable one-year prediction of various clinical symptoms (e.g., depression, anxiety), but the PID-5 had stronger one-year predictive validity with respect to naturalistically observed EMA variables and informant reports of interpersonal functioning²⁵⁸.

Diagnostic stability and course of illness

Strong evidence indicates that the PD features defined by LPF become recognizable during adolescence or early adult life, with several studies demonstrating the validity of LPF measures in adolescents, including the LPFS-BF 2.0^{85,86}, the LoPF-Q 12-18^{135,170,259-261}, and the STIP 5.1¹⁴².

The natural course of LPF over adolescent development was documented in a study of 1,477 adolescents in the community, which showed that levels of LPF assessed at baseline were maintained through adolescence, and that rate of change in LPF was predicted by high levels of psychopathology at baseline¹¹⁵.

Course of illness in treatment-seeking adults was evaluated in a Norwegian study, which showed that, although there is significant improvement in LPF symptoms over time, psychosocial dysfunction remains relatively high²³³. This finding mirrors the general consensus for the course of Borderline PD²⁶²⁻²⁶⁴.

Two studies speak to the relative stability of LPF over medium-term intervals. In a study of 93 outpatients followed up approximately 1.5 years later, Wright et al²⁶⁵ evaluated rank-order stability of proxy measures for LPF across eight indices of impairment, yielding coefficients of 0.17-0.65, with a mean rank-order stability

of 0.37. This estimate was lower than for maladaptive trait domains, which showed a coefficient of 0.71, suggesting stability of PD traits, as conceptualized in most models of trait-based PD. In another study, Clark et al¹⁹⁵ re-tested individuals eight months after baseline, and demonstrated moderate stability for LPF domains (ranging from 0.43 to 0.53). The mean PID-5 rank order stability was 0.79.

Summary of predictive validators

Overall, the studies reported here indicate strong predictive validity of LPF and AMPD maladaptive traits for treatment response, with a superiority of the AMPD compared to Section II PDs (e.g., for treatment dropout¹⁶⁰). Several studies show that LPF is a malleable treatment target. Extant research suggests that treatment response is similar for LPF-defined personality disorder as demonstrated for Section II PDs, particularly Borderline PD. We note that, although treatment response is relatively well studied for Borderline PD, it is much less so for other traditional PDs. For instance, the most recent meta-analytic review for Cluster C treatment response was conducted in 2009, listing 15 studies between 1982 and 2006²⁶⁶.

Available research on course of LPF and AMPD maladaptive traits confirms that the onset of PD is in adolescence or young adulthood. Research also indicates that personality functioning is less stable than traits, and more susceptible to change.

RELIABILITY

Table 3 summarizes the Type 1 and 2 evidence in terms of reliability of the AMPD, taking into account its strength.

Inter-rater reliability

Strong evidence from ten studies^{114,139,158,161,229,234,267-270} supports the inter-rater reliability (IRR) for interview-based LPFS⁷⁷, averaging an excellent coefficient of 0.87. Keeping in mind that

Table 3 Summary of the evidence concerning the Alternative DSM-5 Model for Personality Disorders (AMPD) reliability

Type of reliability	Basic evidence evaluation (Type 2)		Head-to-head superiority evaluation (Type 1)		
	LPF	Traits	LPF	Traits	LPF + Traits
Inter-rater reliability	+++	+++	++		
Test-retest reliability	+++	+++	+	+	+
Internal consistency	+++	+++	++		

+++ means that the finding was replicated in at least five studies; ++ means that the finding was reported at least twice; + means some evidence for the effect; Type 1 studies are those in which head-to-head comparisons are made between existing and new/proposed criteria sets; Type 2 studies do not require head-to-head comparisons, but simply require evidence that validity, reliability and clinical utility criteria are met. LPF - Level of Personality Functioning.

the LPFS is not a (semi-)structured interview, and that seven of the studies involved lay persons' ratings, this IRR value is notable, and significantly higher than typical IRRs for any categorical PDs.

Strong evidence is also available when using the STiP-5.1¹⁰⁷, with an average IRR of 0.89^{107,140,142,144,271}, and the SCID-5-AMPD Module I, with an average IRR of 0.87. At least one study has reported an excellent IRR estimate for the STiPO, at a value of 0.81¹⁶³.

These data are consistent with a recent meta-analysis²⁷² of seventeen IRR scores across fourteen studies using single-rater ICC or equivalent for total LPFS score. This resulted in a pooled ICC of 0.75, which is above the DSM-5 cutoff for acceptable IRR and indicates good reliability under ICC reporting guidelines^{273,274}.

Moderate evidence from four head-to-head comparisons with Section II PDs further establishes the superiority of the LPF. Morey²⁷⁰ reported an ICC of 0.50 compared to values ranging from 0.11 to 0.49 for individual Section II PDs. Cruitt et al¹⁵⁸ found an ICC of 0.80 for LPF, outperforming the average ICC for the PD categories (0.67).

Strong evidence based on seven studies on maladaptive trait measures yielded mean/median ICCs of 0.73/0.75 for domains and 0.55/0.59 for facets^{99,130,146,200,234,270,275}. Thus, although generally lower than for LPF, trait-domain level IRR was still good, with facets in the fair range.

Test-retest reliability

Strong evidence supports the test-retest reliability of LPF. In two studies in adults^{164,221}, self-report versions of the LPF (the LPFS-SR⁹⁸ and the Self and Interpersonal Functioning Scale, SIFS²²¹) had an average $r=0.90$ over a 2-week interval. A study that evaluated the self-reported LPF in adolescents using the LoPF-Q 12-18²⁷⁶ found a 2-week value of $r=0.76$ ²⁵⁹, suggesting that test-retest reliability may be lower in adolescents, although more studies are needed to assess this question fully.

This level of test-retest reliability compares favorably with values for Section II PDs. An early review of PD temporal stability reported short-term (~2 weeks) mean/median kappa values of 0.55/0.56 for any PD and 0.56/0.59 for specific PDs. Recent studies confirm these low-to-moderate test-retest reliability for Section II PDs^{277,278}.

In a study of 93 outpatients who had a PD diagnosis at Time 1, and completed a Time 2 assessment an average of 1.4 years later³², AMPD domain mean/median trait test-retest reliability was 0.78/0.79, whereas that for facet traits was 0.80/0.81. In a 100-day daily-diary study of 101 individuals diagnosed with any PD²⁷⁹, the mean/median test-retest reliability of five trait domain scores averaged over the 100 days was 0.86, whereas the mean/median day-to-day variability was 0.68/0.69. Thomadakis et al⁸⁹ evaluated test-retest reliability across 4 weeks for the PID-5 and reported an excellent range from $r=0.82$ to $r=0.89$ across the five domains. Fossati et al²⁸⁰ found a 2-month test-retest reliability for PID-5-BF ranging from 0.78 (Negative Affectivity) to 0.97 (Detachment).

Longer-term stability – which, of course, confounds true change with measurement error – has not been widely assessed for AMPD Criterion A, but one longitudinal study¹⁹⁵ found moderately high

stability for a fully dimensional assessment and moderate stability when this value was dichotomized. The AMPD traits were highly stable, but some stability was lost when these were configured as diagnoses based on the traits' continuous dimensions, and dichotomous diagnoses were even less stable¹⁹⁵. Thus, the AMPD provides somewhat more stable values when dichotomized PDs are compared across models and considerably more stability when the models are compared as they are intended to be used – the AMPD dimensionally and the Section II PDs categorically.

Internal consistency

Strong evidence supports the internal consistency of LPF across various assessment tools. Seven studies^{33,139,158,160,161,268,281} evaluated the internal consistency of the interview-based LPFS⁷⁷, mostly relying on clinician raters, with an average alpha of 0.80 across studies. Eight studies^{91,92,107,108,140,271,282,283} evaluated internal consistency of the semi-structured interview-based STiP-5.1¹⁰⁷, averaging 0.95 across studies.

Eleven studies^{71,84-86,128,134,162,222,284-286} across both patient and community samples evaluated the internal consistency of the 12-item self-report LPFS-BF 2.0, averaging 0.82 across studies. Two of these studies provided evidence in support of the internal consistency of the LPFS-BF 2.0 in adolescents, with one showing an omega (reliability coefficient) value of 0.93⁸⁵, and the other an omega of 0.83⁸⁶.

Moderate support for the superiority of LPF over Section II PDs is provided by three studies that carried out head-to-head comparisons. In the first²⁸⁷, the alpha for the LPFS-SR⁹⁸ was 0.93 in an inpatient sample and 0.94 in a college sample, outperforming Section II PDs, which showed alpha values between 0.38 (Obsessive-Compulsive PD) and 0.80 (Antisocial PD) using the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II). In a second head-to-head comparison study, Weekers et al²⁸³ showed that the STiP¹⁰⁷ outperformed the SCID-5-PD, with the former demonstrating an internal consistency alpha of 0.97 and the latter an average alpha of 0.76 across five discrete diagnostic categories. The third head-to-head comparison used Structured Interview for DSM Personality (SIDP) responses to score both the LPF and the Section II PDs. The LPF alpha was 0.85, whereas the mean/median alphas of the Section II PDs were 0.65/0.66 (range: 0.50-0.73), indicating considerable variability in internal consistency across the Section II PDs¹⁹⁵.

Strong evidence in support of the internal consistency of the PID-5 is provided by a meta-analytic review¹⁵³ including 10 studies for domains and 24 studies for facets, which reported a mean domain range of 0.88-0.95 and a mean facet range of 0.70-0.95, which exceeds the internal consistency of most categorical PD assessment tools. This conclusion mirrors the findings of a systematic review including 40 studies, also demonstrating strong internal consistency for the PID-5²⁸⁸. In a study conducted after the publication of those reviews, Clark et al¹⁹⁵ found a mean item-level alpha of 0.93 across trait domains for the PID-5, and a mean alpha of 0.72 for interview-based trait domain scores. For facets, the PID-5 mean

item-level alpha was 0.85.

More recent studies have generally found satisfactory internal consistency across self-reported maladaptive trait domains, with alphas generally above 0.70 for each of the domains, and average alphas across domains above 0.75^{88,89,120,147,227,289}.

Summary of reliability

IRR is excellent for LPF and good for trait-domain measures. IRR values are generally better for LPF than those previously reported for Section II PDs. Indeed, low IRR for categorical PDs was cited as one of the major motivations for the development of AMPD prior to 2013²⁹⁰.

Short-term (~2 week) test-retest reliability for continuous measures of the LPF is high in adults, whereas in adolescents it is slightly lower, and daily variability (i.e., assessed in the context of EMA) is somewhat lower still.

The internal consistency of LPF dimensional measures is very strong, regardless of format (unstructured interview, semi-structured interview, or self-report) and sample. That for PID-5 traits is similarly strong. The internal consistency for traditional PDs ranges widely from poor to relatively strong, with significant heterogeneity within many of the categories.

We also note that, although factor analytic studies are not considered as part of the APA validator criteria set, they provide an important window into the construct validity of a diagnostic construct. In this regard, several systematic reviews point to factor-analytic evidence in support of the LPF construct as either unidimensional or a general factor in a bifactor structure^{7,14,31}. This evidence stands in contrast to the failure of factor-analytic support for the ten discrete PDs^{210,291-293}.

CLINICAL UTILITY

Table 4 summarizes the evidence in support of the clinical utility of the AMPD, taking into account its strength.

Identification of patients with PD

Strong evidence from 13 studies demonstrates that LPF can distinguish patients with vs. without PD. This aspect of clinical utility has been documented for clinician-rated LPFS^{163,193,294}, LPFS rated by lay persons²⁸¹, LPFS-SR^{295,296}, LPFS-BF 2.0^{71,226,297}, STIP-5.1^{91,107,226,282}, and LoPF-Q 12-18 in adolescents¹³⁵.

Strong evidence from five studies in adults has shown the ability of the PID-5 to distinguish between individuals with vs. without PD^{174,294,298-300}.

In a head-to-head comparison study, Clark et al¹⁹⁵ compared the AMPD model with Section II in identifying individuals with PD, using a sample of 305 outpatients and 302 community adults screened for high risk of personality pathology¹⁹⁵. There was a

small (5.3%) difference in overall prevalence of PD between the two models, and they identified largely the same individuals.

Sensitivity and specificity

Strong evidence suggests that LPF measures have excellent sensitivity and specificity. Two studies^{33,281} of the LPFS found an average sensitivity of 0.85 and specificity of 0.80. Three studies^{135,259,276} of the self-report LoPF-Q 12-18²⁷⁶ in adolescents showed an average sensitivity of 0.80 and specificity of 0.76. The SCID-5-AMPD Module I similarly showed an area under the curve (AUC) value of 0.84, suggesting a high degree of precision in detecting PD²²⁵. In a study of 772 inpatients, the PID-5 Borderline PD algorithm provided a good balance of sensitivity, specificity and odds ratio in identifying people with PD from those with bipolar disorder³⁰⁰.

Acceptability among clinicians

Strong evidence reported in six studies has demonstrated acceptability among clinicians (across differing levels of experience) for use of the LPF on a wide range of indices of clinical utility, such as communicating with patients, formulating interventions, comprehensiveness, and global descriptive utility^{234,281,301-304}. Similarly, strong evidence provided support for trait models in describing individuals' personality problems³⁰⁵⁻³¹³.

Strong evidence across six studies conducting head-to-head comparisons of Section II vs. AMPD acceptability among clinicians indicate superiority of the latter model. In a sample of 361 PD experts, Morey et al³⁰¹ demonstrated that they preferred a dimensional (73.4%) over a categorical (26.6%) approach. In another study of 337 clinicians, the AMPD was favored over the DSM-IV-TR PDs with respect to communicating with patients, formulating interventions, comprehensiveness, and global descriptive utility, but clinicians found the categorical system easier to use in professional communication³⁰². In a different paper, the AMPD predicted clinicians' decisions better than the DSM-IV PDs in 10 of 11 clinical judgements¹⁷⁵.

Consistent with these findings, Maffly-Kipp and Morey³¹⁴ asked 136 mental health professionals to provide clinical judgments on a random subset of four (out of a possible 12) case vignettes. For each case, clinicians made a variety of diagnostic judgments corresponding to each model, as well as prognostic judgments. Results showed that the AMPD predictors consistently added unique variance beyond the Section II predictors, whereas the Section II predictors were rarely incremental over the AMPD. Further, the AMPD judgments predicted outcome judgments more consistently (98.3% of regressions) than the Section II predictors (70% of regressions), and the single Criterion A judgment (LPF) was the strongest overall predictor.

In another study among 20 clinicians³⁰³, the SCID-5-AMPD interview was deemed more capable of describing patients' problems than the SCID-II, but required orientation to its less familiar theoret-

Table 4 Summary of the evidence concerning the Alternative DSM-5 Model for Personality Disorders (AMPD) clinical utility

Type of clinical utility	Basic evidence evaluation (Type 2)		Head-to-head superiority evaluation (Type 1)		
	LPF	Traits	LPF	Traits	LPF + Traits
Identification of patients with PD	+++	+++	+	+	+
Sensitivity and specificity	+++	+			
Acceptability among clinicians	+++	+++	+++	+++	+++
Acceptability among patients	+	+	+	+	+
Utility in identifying treatment targets and planning	++	++	++	++	++

+++ means that the finding was replicated in at least five studies; ++ means that the finding was reported at least twice; + means some evidence for the effect; Type 1 studies are those in which head-to-head comparisons are made between existing and new/proposed criteria sets; Type 2 studies do not require head-to-head comparisons, but simply require evidence that validity, reliability and clinical utility criteria are met. PD – personality disorder, LPF - Level of Personality Functioning.

ical basis. No concerns regarding SCID-5-AMPD complexity were noted. In addition, the SCID-5 AMPD outperformed the SCID-II in terms of ease of use with regard to clinical decision making.

These results were confirmed in a large study during the DSM-5 field trials, inclusive of 621 mental health professionals providing data for 1,269 patients, in which the AMPD received favorable clinical utility ratings, and was considered to be better than DSM-IV-TR³¹⁵. Two studies^{234,304} demonstrated that trainees favored the AMPD over Section II PDs on most clinical utility criteria.

Acceptability among patients

Moderate evidence indicates acceptability of the AMPD among patients. Cano and Sharp³¹⁶ compared the full AMPD model with Section II (Borderline PD specifically) among patients and their families (N=154). Participants rated mock diagnostic reports on six indices of clinical utility. The AMPD was favored over Section II on all six indices.

Utility in identifying treatment targets and planning

Six studies used clinical case study designs to evaluate the LPF in terms of identifying treatment targets and planning.

Bliton et al²⁸⁵ showed that LPF was more useful in identifying core deficits of personality pathology for treatment planning than Section II diagnoses, whereas Pincus et al³¹⁷ found that the LPF provided an important severity dimension for treatment planning. In addition, the latter study showed that the AMPD could accommodate both narcissistic grandiosity and vulnerability, whereas the Section II narcissistic PD diagnosis could not.

Skodol et al³¹⁸ found that the LPF provides clinicians with a clear, consistent and coherent system for identifying personality pathology, quantifying its severity and characterizing clinical manifestations in terms of personality impairment. Waugh et al¹¹ showed that the full AMPD model facilitates case conceptualization, is easy to learn and use, and assists in patient feedback. Schmeck et al³¹⁹ documented the clinical utility of the AMPD for work

with adolescents, showing that the LPF provides a useful index for conceptualizing adolescent personality pathology. A head-to-head comparison study³¹⁴ found that cross-validated LPF ratings outperformed combined Section II PDs in determining clinical judgments about required level of care, risk and prognosis.

Summary of clinical utility

Many studies have converged on the conclusion that the LPF meets criteria for clinical utility. Of note, the brevity associated with assessment of only one severity continuum of maladaptive self and interpersonal functioning offers a clear advantage over the ten discrete PDs in the assessment of personality pathology. No information is lost using LPF, but much is gained by the more parsimonious evaluation of personality pathology that it offers.

The studies reviewed here are corroborated by a number of previous reviews and case-studies that have focused on the AMPD's utility for case conceptualization and treatment planning^{12,251, 285,318,320-324}; psychological assessment¹¹; and use in forensic settings³²⁵, as well as two meta-analytic reviews^{9,326} concluding that the AMPD is generally perceived by clinicians as more useful than the current categorical approach.

SUMMARY AND LIMITATIONS OF THE CURRENT EVIDENCE BASE

We evaluated the empirical support for the AMPD organized according to the criteria outlined by the APA guidelines for proposing changes to the DSM-5, which are based on the Kendler-Kupfer update and expansion of the classic Robins-Guze criteria for establishing psychiatric diagnostic validity.

Overall, the research presented here suggests similar patterns of associations for AMPD-defined PD as demonstrated for categorical PD diagnoses in terms of antecedent, concurrent and predictive validators. Specifically, AMPD-defined PD shows associations with similar environmental risk factors, psychiatric history, and sociodemographic, temperament and personality correlates. AMPD-

defined PD also shows similar patterns of comorbidity and functional impairment as Section II PDs. A moderately stable course has been demonstrated, similar to that of studies of Section II PDs. In addition, AMPD-defined PD appears to be as responsive to treatment in naturalistic treatment studies.

Important to note is that, when we state similarities between AMPD-defined PD and Section II PDs for these validators, we refer mostly to the literature base on Borderline PD (and to a lesser extent Antisocial, Schizotypal, Narcissistic and Avoidant PD). This is because the literature base in terms of antecedent, concurrent and predictive validators for the other five PDs is so sparse that it precludes meta-analytic or even systematic review. This means that the current categorical system for the majority of PDs falls short of the evidence required to be considered valid based on Robins-Guze / Kendler-Kupfer criteria. In addition, only Borderline PD has a treatment literature strong enough to meet criteria upon which APA Treatment Guidelines could be developed³²⁷.

The convergence between the AMPD and existing Section II PD categories was intentional; that is, the AMPD was not designed to have more predictive validity than traditional PDs³²⁸. Rather, it was designed to cover the same information (and identify the same patients) covered by the traditional categorical disorders, but reorganized into more conceptually coherent dimensions that demonstrate better structural validity. Despite this, some head-to-head comparisons did in fact demonstrate superiority for the AMPD over Section II diagnosis in terms of antecedent, concurrent and predictive validators, suggesting that a dimensional characterization of the personality pathology leads to larger effect sizes in correlates, resulting in incremental predictive validity of the AMPD over Section II (mostly Borderline PD) diagnosis.

The tendency of AMPD-defined PD to outperform Section II diagnoses was even more pronounced for reliability, with inter-rater reliability and internal consistency coefficients consistently higher than those previously reported for categorical diagnoses. This pattern of findings was also evident for clinical utility, with most head-to-head comparisons of Section II vs. AMPD demonstrating improved clinical utility for the latter.

This review, however, also identified areas where research is lacking for the AMPD, most notably that evaluating familial aggregation and/or co-aggregation and biological markers, as well as randomized controlled trials evaluating existing evidence-based treatment approaches (e.g., dialectical behavior therapy and mentalization-based therapy) for use in AMPD-defined PD. More large-scale epidemiological and long-term follow-up studies using AMPD-defined PD are also needed. These are studies that will not be conducted without large-scale funding, which, in turn, may be facilitated by the inclusion of the AMPD in DSM-5 Section II.

The incremental validity demonstrated in the studies reviewed here confirms that the AMPD provides more precise information about what it is to have a PD and how it manifests itself, with full acknowledgement of its heterogeneity and degree of severity. If we have better and more precise information about patients that better predict outcomes, we will also be able to better select which outcomes to pursue and when³²⁸.

RECOMMENDATIONS FOR FURTHER IMPROVEMENT OF THE CURRENT VERSION OF THE AMPD

The research reviewed here also identified areas for improvement of the AMPD.

First, the three-step diagnostic process, especially the hybrid diagnostic aspect, adds unnecessary complexity and redundancy. As shown here, the combination of LPF and maladaptive trait expression more than adequately covers the traditional categories. Thus, a third step in which a hybrid diagnosis is determined is redundant and continues to reify categories whose validity is not documented.

The second major issue is consistency with the ICD-11³²⁹. This diagnostic system, which is now the official one for PD diagnosis in most of the world, mirrors the AMPD in defining a general level of personality functioning in a first step, followed by an option to describe individuals' unique trait manifestations. We recommend that the APA aligns the DSM-5 with the ICD-11 without losing any important aspects of the AMPD that have been empirically validated over the last decade or of the current categorical model.

Against this background, we propose a simplified version of the AMPD that retains its essential features but eliminates some details to reduce complexity. Specifically, we propose:

- Removal of step 3 in the current AMPD diagnostic process, the hybrid diagnosis, based on research demonstrating the coverage of PD constructs by the AMPD reviewed herein. Instead, we propose offering optional specifiers for trait combinations that cover traditional categorical PDs. More precisely, we propose adding optional specification on how maladaptive traits combine to create trait patterns that resemble traditional categorical diagnoses, based on research showing that certain trait and facet combinations provide coverage of the traditional categorically defined PDs in conjunction with the level of personality functioning. A similar step was made in the ICD-11 for Borderline PD. Although such pattern specifiers are ultimately redundant, they may provide important cross-walk information while health systems continue to transition to a dimensional system, with the ultimate goal of eventual removal of these remnants of the traditional PDs over time.
- Removal of the requirement that at least two of the four elements of LPF need to be present, based on the fact that an overall level of 2 on the 5-point scale from healthy/typical to severely impaired has strong sensitivity (0.85), specificity (0.73) and AUC (0.83) for predicting PD³³. In addition, impairment in two of the four components was the empirically derived algorithm for the hybrid PD types, which, as we are proposing, should be removed.
- Providing guidance to users for evaluating LPF severity by placing the levels on a linear severity scale, so that severity increases as self and interpersonal functioning impairment increases in intensity, chronicity, pervasiveness, and impact on psychosocial functioning. This proposed change is motivated by feedback from clinicians using the LPFS asking how features in per-

sonality dysfunction change as a function of severity. By providing this guidance, the levels are not fundamentally changed, but simply operationalized in a more accessible form, with familiar and well-used benchmarks of severity for most psychiatric disorders.

- Changing LPF-level labels to remove the “extreme” label and incorporate a “mild” label. This change is motivated by: a) harmonization with the ICD-11; b) concern in clinical settings that there is no AMPD option for diagnosing “mild” PD in the current LPF; and c) feedback from clinicians that the distinction between “severe” and “extreme” PD does not match the level descriptions in the LPF well. The proposed levels are: little or no impairment (=0), subthreshold impairment (=1), mild impairment (=2), moderate impairment (=3), and severe impairment (=4). This terminology is also consistent with that widely used in the medical field.
- Providing an optional rating scale for Criterion B. In keeping with a dimensional approach, a 4-point rating scale is proposed for specification of trait manifestation: 0= “very little or not at all descriptive”, 1= “mildly descriptive”, 2= “moderately descriptive”, 3= “very descriptive”. Justification for this 4-point scale is provided by ample data on the PID-5, which uses this same 4-point scale when evaluating trait manifestation in individuals.
- Adding Compulsivity as a sixth trait domain. This proposed change is based on the fact that this domain was included in a pre-final DSM-5 proposal and acknowledged as late as 2011²⁷. In addition, adding Compulsivity facilitates alignment with the ICD-11, which includes the trait domain “Anankastia”. Adding Compulsivity will also increase trait coverage of DSM-5 Section II Obsessive-Compulsive PD^{39,330}. Indeed, there is growing evidence that Compulsivity is a trait domain not completely captured by the current AMPD five domain approach^{39,331-333}.

CONCLUSIONS

This review was undertaken at the invitation of the APA Steering Committee to assess the readiness of the AMPD to be included in Section II of the DSM-5. To this end, we used the criteria required by the APA for proposals submitted for further revising the DSM-5. Moreover, we aimed to propose a revised, simplified version of the AMPD informed by the last decade of research.

We conclude that the accumulated evidence supports the inclusion of the AMPD in Section II, with recommended amendments aimed at further simplifying the model and bringing it in closer alignment with the ICD-11. With these proposed changes, we address the call for a simplified version of the AMPD that is nonetheless able to leverage the empirical support to its current version, whose essential features remain unchanged. Thus, the proposed simplified version does not necessitate any further development of measures or assessment tools.

Further, we contend that the proposed changes do not introduce any unwanted negative consequences for providers or patients. The proposed changes do not imply removal of LPF or trait domain features, except for the removal of the hybrid diagnosis,

which has been proven to be redundant. Concerns over the removal of the hybrid diagnosis are mitigated by the pattern specifiers in the proposed simplified version. Moreover, the data we presented on head-to-head comparisons with Section II PDs indicate that users of the simplified AMPD will be able to describe the behavioral patterns, as well as the phenomenology, associated features, correlates and outcomes of traditional PDs more precisely than the categorical diagnosis itself through the inclusion of LPF and trait domains.

Another concern may relate to the argument that, if the simplified AMPD is to be consistent with the ICD-11 diagnostic system for PD, an option may be to just use the ICD-11. We decided against this option given the wealth of empirical research that exist for the AMPD – a much larger literature base than that for the ICD-11 system.

Much research has accumulated since the publication of the AMPD in the DSM-5, and our review offers clear evidence that the criteria for its inclusion as the main DSM PD model have been met. The ICD system has already shifted to align with the burgeoning empirical literature. Our recommendation is that the DSM follow suit and be brought into alignment with the scientific literature reviewed here, as well as with the general international consensus supporting an empirically based nosology for PDs.

ACKNOWLEDGEMENTS

The authors wish to thank the clinical scientists who served on the initial committee invited to undertake a review of the AMPD literature, including L. Choi-Kain, R. Dudley, L. Morey, J. Oldham, C. Seijas-Rodriguez and M. Zanarini. They also thank D. Clarke and L. Yousif from the American Psychiatric Association.

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DOI:10.1002/wps.21339