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Stability of the DSM-5 Section III Pathological Personality Traits and their Longitudinal Associations with Psychosocial Functioning in Personality Disordered Individuals

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Abstract

This study was conducted to establish (a) the stability of the DSM-5 Section III personality disorder (PD) traits, (b) whether these traits predict future psychosocial functioning, and (c) whether changes in traits track with changes in psychosocial functioning across time. Ninety-three outpatients (61% Female) diagnosed with at least one PD completed patient-report measures at two time-points (M time between assessments = 1.44 years), including the Personality Inventory for the DSM-5 and several measures of psychosocial functioning. Effect sizes of rank-order and mean-level change were calculated. In addition, Time 1 traits were used to predict functioning measures at Time 2. Finally, latent change score models were estimated for DSM-5 Section III traits and functioning measures, and correlations among latent change scores were calculated to establish the relationship between change in traits and functional outcomes. Findings demonstrated that the DSM-5 Section III traits were highly stable in terms of normative (i.e., mean-level) change and rank-order stability over the course of the study. Furthermore, traits prospectively predicted psychosocial functioning. However, at the individual level traits and

functioning were not entirely static over the study, and change in individuals' functioning tracked with changes in trait levels. These findings demonstrate that the DSM-5 Section III traits are highly stable consistent with the definition of PD, prospectively predictive of psychosocial functioning, and dynamically associated with functioning over time. This study provides important evidence in support of the DSM-5 Section III PD model.

Keywords

Personality Disorders; Longitudinal Stability; DSM-5 Section III; Personality Disorder Traits

Personality disorders (PD), by definition, are enduring and stable forms of psychopathology. This aspect is reflected in the general diagnostic criteria for PD in the *Diagnostic and Statistical Manual of Mental Disorders – 5th Edition (DSM-5)*, which require that the maladaptive patterns of inner experience and behavior be “stable and of long duration” (p. 647). However, the accumulated results of several naturalistic studies indicate that DSM PD diagnoses and symptom counts do not exhibit a level of stability consistent with the clinical description of the phenomenon (Grilo et al., 2004; Lenzenweger, 1999; McGlashan et al., 2005; Zanarini, Frankenburg, Reich, & Fitzmaurice, 2012). This general finding was cited as a major reason for developing a revised system for characterizing and diagnosing PDs published in Section III (Emerging Models and Measures) of the DSM-5 (Skodol et al., 2011). Although past research suggests that dimensional assessments of PD traits are more stable than disorders or symptom counts (Hopwood et al., 2013; Morey et al., 2007; Samuel et al., 2011), the longitudinal (i.e., > 1 year) stabilities of the DSM-5 traits remain unknown. The current study was conducted to determine the mean-level, rank-order, and individual stability of the DSM-5 PD traits, as well as the longitudinal associations among traits and psychosocial functioning.

Central to the concept of a PD is the enduring nature of the dysfunction, reflected in long-term persistent impairment. Although persistence is observed clinically, empirical findings paint a picture of considerable instability when PD diagnoses or symptom counts are followed prospectively using state-of-the-art empirical methods. In particular, the pattern of mean change is one of resolution or amelioration of symptomatology. For example, in the diagnoses followed in the Collaborative Longitudinal Personality Disorders Study (CLPS), 24-month remission rates ranged from 50% (avoidant PD) to 61% (schizotypal PD; Skodol et al., 2005). Similar findings have been observed in other studies (Cohen, Crawford, Johnson, & Kasen, 2005; Lenzenweger, 1999; McDavid & Pilkonis, 1996; Zanarini et al., 2013), and the same picture emerges when considering the more fine-grained changes associated with symptom counts as opposed to categorical diagnoses.

In contrast, personality traits, including pathological traits (e.g., grandiosity, emotional lability), exhibit much higher rates of stability than PD symptoms (Clark, 2009; Hopwood et al., 2013; Morey et al., 2007; Roberts & Mroczek, 2008). Rank-order stability of traits is markedly higher when compared with dimensional PD symptom counts (Hopwood et al., 2013; Morey et al., 2007). Furthermore, although PD symptoms tend to remit over time on average, psychosocial dysfunction remains much more stable, likely accounting for the

clinical observation of stability of impairment in PD (Skodol et al., 2005). Notably, both PD symptoms and personality traits have been shown to prospectively predict psychosocial functioning (Hopwood & Zanarini, 2010; Morey et al., 2007), although the effects are stronger for traits. Taken together, these findings have contributed to the strong evidence base showing the limitations of the existing diagnostic framework for PD, as well as the need to move to a model that would more closely match the basic definition of PD as a disorder characterized by longitudinal stability (Skodol et al., 2011).

The DSM-5 currently presents two complete systems for diagnosing PD. The first, in Section II of the manual (Diagnostic Criteria and Codes), reflects only modest textual changes to the structure that has been in place since DSM-III. However, a second complete model reflecting major innovations is included in Section III (Emerging Models and Measures). This model includes a detailed description of PD-specific impairments (Criterion A) in the form of self- and interpersonal-dysfunction that replaces the general definition of PD, and a dimensional model of PD features (i.e., pathological traits) intended to map individual differences in PD expression (Criterion B). Remaining criteria reflect the standard requirements for pervasiveness (Criterion C), stability (Criterion D), and that the disorders are not better accounted for by other mental disorders, substances, or developmental stage (Criteria E, F, G). Although this model purports to address many of the documented limitations of the Section II model, these claims must be directly studied using the constructs and assessment instrumentation intended for use with the new model (e.g., the Personality Inventory for the DSM-5; PID-5; Krueger et al., 2012). In particular, the presumed benefit of bringing the empirical stability of PD features in line with the PD definition by switching to this trait model has not been tested.

The current study had three primary aims. First, we sought to establish the stability of the DSM-5 Section III PD features (both primary traits and higher order domains) in individuals diagnosed with PDs over the course of 1.4 years. Our goal was to characterize both mean-level (i.e., normative) and rank-order stability, which are conceptually and quantitatively distinct. Second, we investigated whether the DSM-5 traits prospectively predicted psychosocial functioning. Finally, given prior research that has shown individual heterogeneity in PD and trait trajectories over time (Lenzenweger, Johnson, & Willett, 2004; Wright, Pincus, & Lenzenweger, 2011), we examined whether individual changes in psychosocial functioning were associated with individual changes in PD. This study is the first to examine the longitudinal performance of the DSM-5 Section-III PD model features and provides an important test of whether the putative benefits of adopting dimensional PD features in the new model are in fact evident when the model is implemented in patients diagnosed with PDs.

Method

Sample and Procedure

Data were obtained from a clinical sample enrolled in an ongoing study to improve efficient measurement of PD (Simms et al., 2011). At Time 1, participants for the present study were recruited by distributing flyers at mental health clinics across Western New York, and were eligible to participate if they reported psychiatric treatment within the past two years. Time 1

exclusionary criteria were age under 18 years and evidence that the collected data were untrustworthy.¹ The final sample included 628 participants, who received structured clinical interviews by trained assessors and completed patient-report inventories. Based on the Time 1 clinical interviews, a subsample of participants was invited back for a second assessment involving the completion of additional patient-report measures. The inclusionary criterion for being invited for a second assessment was a positive diagnosis of any PD on the clinical interview.

One hundred and sixteen participants attended the Time 2 assessment, 93 of which had completed the relevant patient-report measure at Time 1 (i.e., the PID-5). The average time between assessments was 1.4 years (Range = 1.2–1.7 years; *SD* = 0.16 years). Of the 93 participants completing both assessments, 58 (61%) were female, 75 (81%) identified as White, 16 (17%) as African-American, 2 (2%) as Native American, and 6 (7%) as Hispanic/Latino. The average age was 42.7 years (*SD* = 13.6). Among participants completing both assessments, on average they met the criterion for 2.4 PDs (Range = 1–8). DSM-5 Section II PD diagnoses were as follows: 35% paranoid, 11% schizoid, 16% schizotypal, 6% antisocial, 43% borderline, 0% histrionic, 24% narcissistic, 51% avoidant, 4% dependent, and 53% obsessive-compulsive. Additionally, 62.4% met the threshold for a mood disorder diagnosis, 66.7% for an anxiety disorder, 24.7% for a substance use disorder, and 7.5% for a psychotic disorder. At each assessment, prior to participating in the study procedures, a complete description of the study was provided to participants and written informed consent was obtained. The relevant institutional review board approved all study procedures.

Measures

The DSM-5 Section III traits were assessed using the PID-5. The PID-5 is a patient-report instrument that includes 220 questions measuring 25 DSM-5 Section III PD traits, organized based on factor analytic evidence into five broad domains: Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism. PID-5 items are rated on a four-point scale ranging from 0 (very false or often false) to 3 (very true or often true). We calculated the broad domain scales using the formulae provided in the PID-5 scoring sheet. Negative Affectivity is the average of Emotional Lability, Anxiousness, Separation Insecurity; Detachment is the average of Withdrawal, Anhedonia, and Intimacy Avoidance; Antagonism is the average of Manipulativeness, Deceitfulness, and Grandiosity; Disinhibition is the average of Irresponsibility, Impulsivity, and Distractibility; and Psychoticism is the average of Eccentricity, Unusual Beliefs and Experiences, and Perceptual Dysregulation. Adequate to good internal consistencies were achieved in the current sample at both time-points (see Table 1).

Psychosocial functioning was measured using three different measures. The first, created specifically for the parent study this sample was drawn from, is a 5-item measure—the Multidimensional Dysfunction Aggregate (MDA)—with one item each dedicated to five

¹Participants were excluded if (a) preliminary analyses indicated excessively inconsistent responding based on ad hoc inconsistency indices, (b) they had excessive missing responses on patient-report scales (i.e., more than 50%), or (c) they exhibited behaviors in session that suggested that their responses were not trustworthy (e.g., under the influence of substances). Sixty-seven participants were excluded due to data untrustworthiness.

domains of functioning: (1) personal and life happiness, satisfaction, and optimism; (2) limitations in mobility, self-care, and social participation; (3) limitations in ability to control impulses, act responsibly, and be self-directed; (4) problems in relationships; (5) limitations in ability to work effectively and efficiently at work/school. At Time 1 participants responded to these items using a visual analogue scale ranging from *Not at All* to *Very Much*; at Time 2 an ordinal scale with the same anchors was used. Time 2 responses were rescaled to the Time 1 metric to allow for mean-level comparisons between time-points. In addition, participants completed the 32-item form of the Inventory of Interpersonal Problems (IIP; Soldz, Budman, Demby, Merry, 1995), a measure composed of items derived from common presenting problems in outpatient treatment (Horowitz, Rosenberg, Baer, Ureno, & Villaseñor, 1988). The total IIP score was used as a measure of interpersonal problems. Finally, participants completed the well-known Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), which is a five-item scale reflecting general satisfaction with life. Descriptive statistics for all measures are presented in Table 1.

Data Analysis

The analytic plan involved three steps. First, we calculated descriptive statistics for each scale at both assessment time-points and estimated effect sizes for normative change (i.e., mean-level change) in the form of Cohen's d and rank-order stability in the form of Pearson correlations. Second, we predicted Time 2 functioning from Time 1 traits by regressing Time 2 functioning scores on Time 1 traits. Third, we used latent difference score models to estimate change between assessments (see Figure 1). Latent change score models allow for modeling differences between scale scores across time within a structural equation modeling framework (McArdle & Prindle, 2008). Significant variance parameters of the latent difference scores reflect interindividual heterogeneity in change over time. This permits the flexible testing of associations between change scores and other variables, either as a correlate, predictor, or outcome (McArdle, 2009). For instance, one can test whether individual change is significantly associated with initial values. Further, when bivariate (e.g., traits and functioning) models are estimated, the latent changes in each set of variables can be correlated to estimate the dynamic relationship between changes in each system over time (see Figure 1). This is the approach adopted here, such that bivariate latent change score models were estimated for each pair of traits and functioning scales, and the association among change scores (parameter A in Figure 1) tested for significance.² Age and gender were included as covariates in the prediction of future functioning and latent change, and when significant, initial values also served as covariates of latent change.

Results

We studied different aspects of stability and change using quantitatively distinct methods. First, the mean-level stability analyses provide an estimate of the average change in the sample. Table 1 provides descriptive statistics and Cohen's d effect size estimates for the

²We use observed scale scores when estimating the latent change score models rather than latent variables. Although latent variables would control for measurement error, the modest sample size relative to model complexity (i.e., at times large number of items on the PID-5 scales and the ordinal nature of these items), proved problematic. Attempts at using a latent variable approach resulted in a subset of models with problematic solutions (e.g., non-positive definite matrices, questionable standard errors). Therefore we report the results of the observed score models. Importantly, the fully latent models were entirely consistent with those reported below.

trait scales, broad domain scores, and functioning measures. For the primary traits, the median absolute d across time-points was .12 (range = .07 to .30), which overall reflects negligible mean-level change in the context of standard rules-of-thumb for d (i.e., small = .2, medium = .5, and large = .8). Notably, three-fourths of the primary traits (19 of 25) did not achieve even small change, and none of the broad domains demonstrated even small change (Median $|d|$ = .13; range = .00 to .17). Exceptions included Submissiveness, Restricted Affectivity, Withdrawal, Irresponsibility, Rigid Perfectionism, and Risk Taking, each of which showed small decreases over the course of the study. Functioning was similarly stable in terms of mean-level change (median $|d|$ = .13; range = .00 to .45), with the exception of a small decrease in the IIP, and a nearly medium increase in the single item reflecting life satisfaction. A significant change ($p < .05$) roughly corresponded to a small effect size, such that all traits and functioning measures that exhibited at least small change also were significantly different between time points. Grandiosity and Callousness also exhibited significant mean change.

Rank-order stability is provided in raw Pearson r values between time-points, and the same values corrected for scale unreliability, r' . We found that on the average primary traits (Median raw r = .68; Median unreliability-corrected r' = .80) and domains (Median raw r = .73; Median unreliability-corrected r' = .78) were highly stable over the course of the study. Individuals exhibited some what less stability on the five-item general functioning scale, although the IIP and SWLS scores were quite stable.

We next prospectively predicted functioning using PID-5 trait scores. As can be seen in Table 2, with several exceptions—Intimacy Avoidance, Attention Seeking, Grandiosity, Manipulativeness, Risk Taking, and Unusual Beliefs—Time 1 scales and domains significantly predicted some form of functioning at Time 2. Significant results always were in the direction of PD traits predicting worse functioning or lower satisfaction with life. The strongest average coefficients were observed for MDA Aggregate Functioning ($M\beta$ = .25), MDA Relationship Problems, and the IIP ($M\beta$'s = .21). However, these were only modestly higher than the lowest average coefficients, observed for MDA Impulse Control ($M\beta$ = .16) and Mobility/Self-Care Limitations ($M\beta$ = .17).

Finally, we evaluated whether change in functioning tracked with change in trait scores. We used a latent difference score framework, which controlled for Time 1 scores in each scale and thus protected against regression-to-the-mean effects. We found significant variability in the latent difference scores for each trait and functioning measure, indicating individual variability in change over time. We then correlated latent change in traits and functioning. Results are presented in Table 3. With the exception of the primary traits of Risk Taking, Manipulativeness, and Deceitfulness, change in patient-reported functioning was associated with individual changes in the traits. The strongest average results were observed for IIP scores ($M\beta$ = .35), MDA Aggregate Functioning ($M\beta$ = .31), and MDA Work Problems ($M\beta$ = .29). Considerably lower average coefficients were found for MDA Mobility/Self-Care ($M\beta$ = .17) and SWL ($M\beta$ = .21).

Discussion

A significantly revised PD model was proposed in the development of the DSM-5. This model includes a dimensional trait system to capture individual differences in the expression of PD. Dimensional traits were proposed, in part, because the disorders and symptoms in the existing model of PD exhibited considerable instability, which is inconsistent with the definition of these disorders; dimensional trait models have the potential to remedy this limitation. Here we examined the stability of the DSM-5 trait model as assessed via patient-report using the PID-5, the official instrument created for assessing the DSM-5 traits in practice.

In general, our findings show that PD traits are highly stable in both mean-level and rank-order over the course of approximately 1.5 years. Remarkably, only 6 of the 25 traits exhibited even a small degree of mean change (i.e., Cohen's $d > .20$), and all of these demonstrated what would be considered only small change. Although still small in effect size, the largest amount of average change was observed with Submissiveness. All six of the small effects were in the direction of modest decreases over time, which is consistent with some amelioration of symptomatology that would be expected. On the whole, the average normative (i.e., mean) stability compares favorably to prior studies of DSM-IV or DSM-5 Section II defined symptoms where comparable coefficients have been relatively lower (Grilo et al., 2004; Lenzenweger, 1999; Samuel et al., 2011). For instance, in the most methodologically similar study (i.e., following adult patients diagnosed with PD over similar duration, 2 years vs. 1.44 years), Samuel and colleagues (2011) reported a median $d = -.31$ for interviewer-scored criteria, and $d = -0.24$ for self-reported criteria, whereas here we found a median $d = -.12$. In terms of rank-order stability, we found our estimates ($Mdnr = .68$) were stronger than the median value for Samuel and colleagues' interview-based criteria ($Mdnr = .54$), and identical to self-reported criteria ($Mdnr = .68$). The comparisons are much the same when considering Lenzenweger's (1999) findings averaging across waves (1.41 years). Thus, the DSM-5 personality traits appear to demonstrate less absolute decline, but comparable rank-order stability, compared to the DSM-IV/DSM-5 Section II criteria relative to studies of similar time spans and methodologies.³ As Samuel et al. (2011) argue, more work is needed to clarify the precise reasons personality traits consistently provide increased stability over PD criteria (e.g., self-rated vs. other-rated, item content, reliability, difficulty assessing personality via interview).

The prospect of transitioning to a more temporally stable PD system carries with it several implications. On the surface, it creates a greater match between research findings and the clinical description of PDs as a psychopathology of long duration. At the same time, the accumulated research demonstrating the mutability and even considerable change in DSM-defined personality pathology over time has generally been considered welcome news—these disorders do not carry with them a life sentence. Such findings, in turn, have emboldened researchers to uncover the determinants of this change and clinicians to view PD, particularly borderline PD, as a treatable condition (Gunderson, 2009). Thus, to eschew

³The self-reported criteria in Samuel et al. (2011) were drawn from the Schedule for Nonadaptive and Adaptive Personality (Clark, 1993), whereas Lenzenweger (1999) used the Millon Clinical Multiaxial Inventory – II (Millon, 1987).

a finite criteria-set based system in favor of a dimensional trait system may seem like it could threaten the gains made in professional and public opinion of the PDs as treatable disorders. However, the actual data paint a more complex picture. Of particular note, it is well documented that even as DSM-defined symptoms remit in naturalistic studies, the maladaptive underlying traits and impairments in functioning appear to endure (Gunderson et al., 2011; McMain et al., 2012; Zanarini et al., 2012). Evidence also now shows that individual change in basic traits and symptoms track together over time, even as the traits show much more modest absolute change (Wright et al., in press; Wright et al., 2013). The question then becomes, which aspects of PD are stable and truly trait-like in their manifestation, and which aspects might be more transient or reflective of temporary exacerbations of underlying traits (McGlashan et al., 2005; Zanarini & Frankenberg, 2007)? Moreover, what are the treatment implications of PDs having both stable and unstable features?

Furthermore, we also found that traits assessed at baseline significantly predicted psychosocial dysfunction and life satisfaction at the second assessment. This demonstrates that the DSM-5 traits serve an important prognostic function. Focusing first on the outcomes, we found that the traits demonstrated only a modest degree of discrimination in predicting aspects of psychosocial functioning in the long-term. Specifically, traits most strongly predicted relationship problems, generalized interpersonal distress, and the aggregated measure of functioning. In contrast, traits were relatively less predictive of difficulties with mobility and self-care and impulse control. This pattern of associations, although only modestly discriminable, is consistent with the proposed emphasis on impairments in social functioning as central to the construct of PD in the Section III model. Therefore these results further support the construct validity of the trait model, which has previously been shown to demonstrate strong associations with patterns of interpersonal dysfunction cross-sectionally (Wright et al., 2012).

In addition, differences in patterns of associations with functioning among facet scales within a given domain highlight the utility of considering facets in addition to the broader domains. For instance, Separation Insecurity and Submissiveness deviate from higher-order Negative Affectivity's generally robust prospective association with dysfunction. What separates these two scales from others in the domain is their associations with warm/warm-submissive interpersonal styles (Wright et al., 2012), suggesting that perhaps this mitigates the progression of impairments to some degree. The Antagonism domain's generally modest and mostly non-significant association with dysfunction belies the fact that several antagonistic traits (e.g., Callousness, Deceitfulness, and Hostility in its cross-loading) do in fact show robust associations with dysfunction. The suggested scoring for the higher-order domain excludes the features more strongly associated with dysfunction. Within each domain specific scales demonstrate differential patterns of impairments relative to their domain-mates, even as within and across domains there is a greater degree of consistency than not.

Higher degrees of discriminant validity have been found in prior studies examining both concurrent and prospective associations between traits and functioning (Hopwood et al., 2009; Mullins-Sweatt & Widiger, 2010). For instance, more circumscribed relationships

have been found among agreeableness, extraversion, and social functioning, and between conscientiousness and occupational functioning. Neuroticism has consistently demonstrated a relative lack of discriminant validity in predicting functional outcomes. However, a major difference between our results and those reported by Hopwood and colleagues (2009) and Mullins-Sweatt and Widiger (2010) is that they examined normative range traits, whereas here we examine maladaptive traits. Maladaptive trait measures, including the PID-5, generally tend to associate with negative emotionality, disagreeableness, and lack of conscientiousness, regardless of the traits' specific content (e.g., Haigler & Widiger, 2001; Watson et al., 2013). As such, the maladaptive traits in Section III contain much general personality pathology (e.g., Few et al., 2013; Hopwood et al., 2012) in addition to specific impairments, contributing to a blurrier pattern of associations with outcomes. On a related note, the higher order domains in this sample were correlated moderately (M Time 1 $r = .43$; M Time 2 $r = .48$), likely due to their shared saturation with general personality pathology (see supplementary Table S1 for a full matrix of correlations). Here we scored the higher-order domains using only the scales with strong and unique loadings on the domain in factor analytic work. Therefore the possibility remains that scoring schemes that used all of the traits might lead to lower discriminant validity, which immediately raises the question of whether the traditional DSM PD constructs would show better, worse, or similar discriminant validity. Although in these data we do not have the DSM-5 Section II PDs assessed at both time-points, all participants were selected based on interview assessed PDs, and therefore we are able to compare the prospective patterns of prediction in each. The DSM Section II PDs were not more discriminant, such that, with the exception of histrionic and obsessive-compulsive PDs, all PDs were significantly associated with half or more of the dysfunction domains (detailed results are provided in the supplementary Table S2).

As past research has shown, even in the presence of high levels of rank-order and mean-level stability, individuals may demonstrate rich heterogeneity in changeover time reflecting subtle individual differences in change. We examined this possibility using structural equation models, which also controlled for initial values to protect against regression-to-the-mean effects. Although highly stable in the aggregate level, we found significant variability in individual stability in both traits and psychosocial functioning. Moreover, individual differences in change were related across each system, suggesting that as individuals gradually improve or decline in terms of their pathological traits, so too does their psychosocial functioning. Such a dynamic longitudinal relationship between pathological personality traits and psychosocial functioning in adults has not previously been demonstrated and thus is an important finding. Prior work has relied on prospective prediction, and inferred that changes in each system tracked together (e.g., Morey et al., 2007). This provides an important demonstration of the link between traits and psychosocial functioning. On the whole the patterns of associations were similar to those from the prospective models, albeit with increased magnitude and some interesting differences. For example, in line with the prospective results changes in the domains of Negative Affectivity, Detachment, and Disinhibition demonstrated the most consistent associations with changes in functioning. Yet several specific traits that were not predictive of future dysfunction were robust predictors of change in dysfunction (e.g., Grandiosity, Separation Insecurity). The increase in magnitude of associations overall highlights the importance of measuring

concurrent change in order to understand more proximal processes of trait associations with impairments.

Although these findings offer strong support for the longitudinal stability of DSM-5 traits and their prospective and dynamic importance in the prediction of psychosocial functioning over time, future work is needed to replicate and extend this work. For one, we employed the PID-5, which is the official patient-report instrument provided for use in clinical settings, but the generalizability of these results to clinician-rated traits remains an open question for future research. As psychometrically robust clinician interviews are developed, future research should pursue these same questions. It bears mentioning that emerging research demonstrates that the clinicians find the new model clinically useful (Morey et al., 2013). On a related note, Criterion A (i.e., self/interpersonal dysfunction) was not assessed in this sample, and therefore must be investigated in future work to comprehensively capture the full Section III PD model. In addition, longitudinal designs that rely on only two waves of data are limited in their ability to speak to *trajectories* of change among additional conceptual caveats (McArdle, 2009; McArdle & Nesselroade, 2003). To measure trajectories (including shape and rate of change), at least 3 (and preferably more) time-points are needed. With two time-points we only can speak to initial and final values over the time-span measured. Also, by regressing latent change scores on initial values, we are making an assumption that initial values do not reflect arbitrary points along an ongoing change process. Nevertheless, models with and without this parameter resulted in identical conclusions, and even when arbitrary the model conveys the same information as the familiar autoregressive change model. A stronger design would experimentally manipulate putative change mechanisms (e.g., Kamarck et al., 2009; McArdle & Prindle, 2008), making initial values non-arbitrary and allowing causal inferences about the change processes. Future research is needed that experimentally perturbs putative change process in PD in an effort to draw mechanistic conclusions (Kendler, 2014). Finally, this study was performed in a sample comprised exclusively of individuals with PD. Although such a sample provides important information about how these scales may perform in clinical populations, evidence shows that these traits, and PDs in general, are distributed continuously in the population. As such, our range is restricted and these results may only reflect a lower-bound estimates of rank-order stability, and thus future work is needed to extend these findings to samples with a broader distribution of PD symptomatology.

In conclusion, this is the first study to examine a key aspect of the rationale for adopting a dimensional trait system to describe individual differences in PD. Our findings suggest that PD traits exhibit levels of stability in patients that are more consistent with the core definition of PD than most extant PD criteria. Moreover, we found for the first time that *changes* in PD traits over time are related to *changes* in psychosocial functioning. Taken together, our findings contribute evidence in support of migrating the classification of PD in the next revision of the diagnostic nosology to a dimensional trait-based system such as that presented in the DSM-5 Section III PD model.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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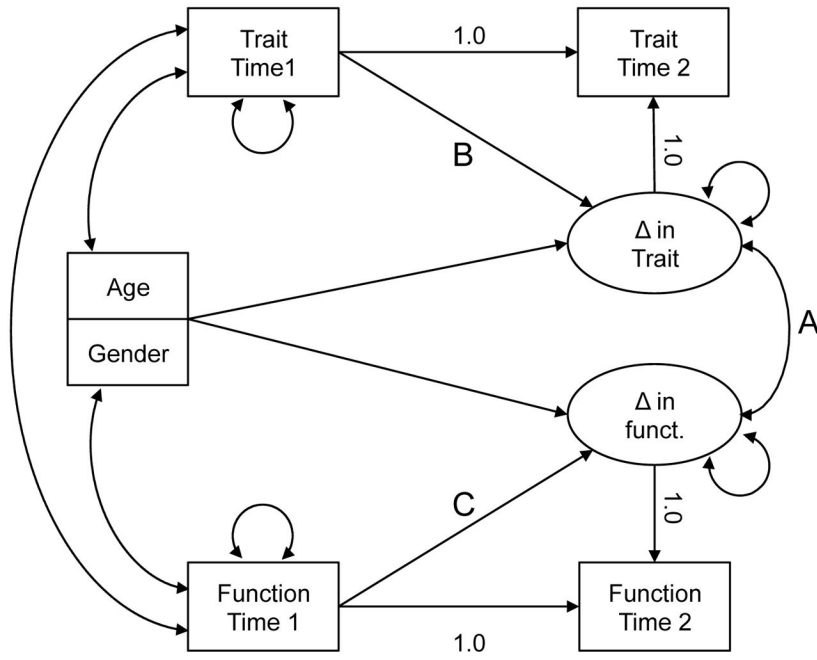


Figure 1. Diagram depicting generic bivariate latent change score model. Parameter A = correlation among latent change scores, Parameters B and C = regression of latent change scores on initial values. In the estimated models both latent trait change and latent functioning change were regressed on both age and gender.

Table 1
Descriptive statistics and stability coefficients for PID-5 scales and domains and functioning measures

	Time 1			Time 2			Mean Change			Rank-Order	
	M	SD	α	M	SD	α	d	p	r	r'	
Negative Affectivity	1.46	.61	.93	1.46	.71	.95	.00	.966	.73	.78	
Emotional Lability	1.50	.76	.89	1.55	.87	.91	.07	.386	.74	.82	
Anxiousness	1.72	.70	.88	1.75	.76	.90	.04	.692	.59	.66	
Separation Insecurity	1.17	.69	.84	1.09	.78	.87	-.10	.223	.68	.80	
Submissiveness	1.45	.65	.77	1.24	.70	.76	-.30	.009	.41	.54	
Hostility	1.29	.69	.90	1.23	.67	.88	-.08	.255	.78	.88	
Perseveration	1.22	.62	.84	1.19	.66	.84	-.03	.724	.63	.75	
Detachment	1.21	.53	.91	1.15	.55	.89	-.10	.250	.62	.69	
Anhedonia	1.46	.69	.88	1.40	.78	.91	-.08	.403	.62	.69	
Depressivity	1.17	.69	.93	1.16	.77	.94	-.02	.813	.68	.73	
Intimacy Avoidance	.74	.69	.78	.77	.66	.81	.04	.640	.65	.82	
Restricted Affectivity	.98	.59	.78	.83	.64	.79	-.25	.002	.72	.92	
Suspiciousness	1.27	.63	.80	1.29	.65	.78	.03	.671	.75	.95	
Withdrawal	1.43	.62	.88	1.29	.71	.90	-.21	.291	.58	.65	
Antagonism	.77	.50	.90	.68	.51	.93	-.17	.025	.73	.80	
Attention Seeking	.94	.66	.87	.84	.65	.85	-.16	.070	.65	.76	
Grandiosity	.76	.61	.80	.66	.54	.72	-.19	.048	.61	.80	
Callousness	.54	.51	.89	.45	.45	.86	-.18	.047	.65	.74	
Deceitfulness	.66	.55	.87	.59	.54	.87	-.13	.084	.74	.85	
Manipulativeness	.87	.66	.80	.79	.69	.83	-.12	.125	.71	.87	
Disinhibition	1.01	.56	.92	.93	.54	.92	-.15	.047	.75	.82	
Distractibility	1.31	.69	.91	1.23	.72	.89	-.11	.161	.70	.78	
Impulsivity	1.05	.70	.85	1.00	.72	.86	-.06	.477	.66	.77	
Irresponsibility	.66	.59	.82	.54	.52	.78	-.22	.004	.75	.94	
Rigid Perfectionism	1.41	.62	.86	1.27	.76	.91	-.20	.023	.66	.75	
Risk Taking	1.26	.58	.89	1.14	.54	.88	-.22	.005	.73	.82	
Psychoticism	.85	.56	.95	.77	.54	.94	-.13	.075	.74	.78	

	Time 1			Time 2			Mean Change			Rank-Order		
	M	SD	α	M	SD	α	d	p	r	r'	r	r'
Eccentricity	1.17	.82	.96	1.07	.78	.95	-.13	.093	.75	.79	.75	.79
Perceptual Dysregulation	.71	.53	.83	.64	.54	.85	-.14	.097	.68	.81	.68	.81
Unusual Beliefs	.66	.60	.82	.61	.56	.80	-.08	.386	.72	.89	.72	.89
Primary Traits Mean/Median	1.10/1.17	.65/.65	.85/.86	1.03/1.09	.67/.67	.85/.86	-.11/-.12	--	.67/.68	.79/.80	.67/.68	.79/.80
Domains Mean/Median	1.06/1.01	.55/.56	.92/.92	1.00/.93	.57/.54	.93/.93	-.11/-.13	--	.71/.73	.77/.78	.71/.73	.77/.78
<i>Functioning Measures</i>												
Satisfaction	.40	.28	--	.51	.23	--	.45	.000	.33	--	.33	--
Mobility/Self-Care	.49	.33	--	.47	.29	--	-.08	.797	.30	--	.30	--
Impulse Control/Self-Direction	.38	.30	--	.43	.29	--	.16	.192	.17	--	.17	--
Relationship Problems	.54	.32	--	.50	.32	--	-.12	.402	.30	--	.30	--
Work	.49	.35	--	.49	.34	--	-.00	.872	.25	--	.25	--
General Functioning	.30	.20	.62	.27	.22	.79	-.13	.278	.32	.46	.32	.46
IIP	1.39	.63	.93	1.19	.67	.93	-.31	.008	.65	.70	.65	.70
SWLS	3.00	1.39	.89	3.03	1.50	.85	.02	.810	.56	.64	.56	.64

Note. N=93. d = Cohen's d; r = Pearson r; r' = Pearson r corrected for scale unreliability. Average time between assessments = 1.44 years. Bolded values reflect Cohen's d values .2.

Table 2

Standardized coefficients of DSM-5 traits predicting future psychosocial functioning.

	Multidimensional Dysfunction Aggregate (MDA)										Satisfaction with Life Scale
	Satisfaction	Mobility/Self-Care Limitations	Impulse-Control Problems	Relationship Problems	Work Problems	Total Functioning	IIP Total Score				
<i>Negative Affectivity</i>	-.21	.15	.22	.26	.22	.29	.37				-.25
Emotional Lability	-.13	.18	.27	.33	.25	.32	.33				-.19
Anxiousness	-.24	.06	.11	.19	.21	.23	.27				-.21
Separation Insecurity	-.17	.13	.17	.13	.09	.18	.34				-.22
Submissiveness	.07	-.03	-.11	-.16	-.09	-.11	.27				.05
Hostility	-.27	.15	.22	.36	.32	.37	.24				-.36
Perseveration	-.23	.20	.17	.23	.28	.31	.39				-.17
<i>Detachment</i>	-.28	.27	.19	.22	.13	.32	.30				-.23
Anhedonia	-.37	.25	.18	.23	.22	.35	.30				-.37
Depressivity	-.40	.26	.15	.27	.18	.35	.35				-.30
Intimacy Avoidance	-.04	.16	.09	.11	-.06	.12	.13				-.04
Restricted Affectivity	-.24	.14	.09	.09	.12	.20	.12				-.10
Suspiciousness	-.25	.19	.26	.26	.26	.33	.29				-.24
Withdrawal	-.25	.25	.19	.18	.15	.29	.30				-.13
<i>Antagonism</i>	-.12	.20	.15	.17	.14	.23	.13				-.11
Attention Seeking	.04	-.04	.04	.14	.08	.06	.04				-.15
Grandiosity	-.03	.13	.13	.05	.02	.12	.09				-.06
Callousness	-.36	.23	.25	.33	.26	.37	.21				-.31
Deceitfulness	-.28	.24	.21	.25	.24	.33	.18				-.17
Manipulativeness	-.02	.13	.06	.13	.10	.15	.06				-.06
<i>Disthibition</i>	-.31	.35	.26	.32	.34	.42	.29				-.30
Distractibility	-.19	.31	.14	.21	.35	.34	.31				-.26
Impulsivity	-.27	.22	.28	.26	.22	.31	.13				-.24
Irresponsibility	-.34	.36	.24	.37	.29	.44	.29				-.25
Rigid Perfectionism	-.15	.01	.15	.23	.07	.15	.08				-.12
Risk Taking	-.13	.15	.07	.18	.01	.11	-.14				-.08

	Multidimensional Dysfunction Aggregate (MDA)							Satisfaction with Life Scale Cicchetti et al. /4
	Satisfaction	Mobility/Self-Care Limitations	Impulse-Control Problems	Relationship Problems	Work Problems	Total Functioning	IIP Total Score	
<i>Psychoticism</i>	-.25	.15	.14	.26	.24	.28	.21	.14
Eccentricity	-.24	.12	.10	.26	.31	.26	.18	-.09
Perceptual Dysregulation	-.24	.18	.19	.22	.16	.26	.20	-.18
Unusual Beliefs	-.15	.12	.09	.19	.10	.19	.18	-.11

Note. $N = 93$. Bolded values significant at $p < .05$. All coefficients presented in standardized form.

Table 3

Correlations among change in pathological traits and patient-reported functioning scales.

	Multidimensional Dysfunction Aggregate (MDA)										Satisfaction with Life Scale
	Satisfaction	Mobility/Self-Care Limitations	Impulse-Control Problems	Relationship Problems	Work Problems	Total Functioning	IIP Total Score				
<i>Negative Affectivity</i>	-.46	.36	.48	.32	.41	.55	.59				-.48
Emotional Lability	-.40	.34	.48	.27	.35	.48	.39				-.41
Anxiousness	-.40	.26	.36	.30	.39	.45	.64				-.43
Separation Insecurity	-.37	.29	.41	.34	.34	.45	.43				-.35
Submissiveness	-.04	.16	.17	-.03	.29	.17	.26				.04
Hostility	-.30	.15	.39	.32	.33	.36	.46				-.38
Perseveration	-.40	.13	.18	.22	.20	.30	.47				-.23
<i>Detachment</i>	-.47	.27	.47	.36	.47	.53	.61				-.43
Anhedonia	-.64	.35	.44	.40	.44	.58	.54				-.61
Depressivity	-.61	.22	.39	.39	.45	.54	.63				-.48
Intimacy Avoidance	.05	.10	.18	.09	.29	.22	.30				-.11
Restricted Affectivity	-.11	.01	.25	.09	.14	.15	.32				-.24
Suspiciousness	-.33	.16	.31	.42	.33	.42	.55				-.25
Withdrawal	-.33	.14	.40	.30	.34	.37	.54				-.21
<i>Antagonism</i>	.05	.08	.22	.13	.26	.15	.16				.00
Attention Seeking	-.04	.04	.05	.04	.25	.12	.00				.00
Grandiosity	-.01	.13	.24	.17	.25	.25	.26				-.07
Callousness	-.06	.17	.31	.25	.10	.27	.11				-.12
Deceitfulness	.04	.10	.16	.03	.21	.12	.12				-.08
Manipulativeness	.07	.01	.16	.10	.14	.05	-.02				.03
<i>Disthibition</i>	-.25	.28	.41	.22	.48	.47	.32				-.28
Distractibility	-.30	.37	.32	.20	.43	.45	.48				-.27
Impulsivity	-.06	.06	.26	.15	.29	.25	.10				-.14
Irresponsibility	-.23	.27	.44	.16	.42	.41	.17				-.13
Rigid Perfectionism	-.06	.18	.10	.15	.13	.17	.43				-.15
Risk Taking	.03	-.07	.03	.04	.11	.02	-.07				.18

	Multidimensional Dysfunction Aggregate (MDA)							Satisfaction with Life Scale Frohne-Hagemann et al., 2003
	Satisfaction	Mobility/Self-Care Limitations	Impulse-Control Problems	Relationship Problems	Work Problems	Total Functioning	IIP Total Score	
<i>Psychoticism</i>	-.25	.19	.15	.22	.25	.28	.47	
Eccentricity	-.22	.15	.08	.25	.31	.26	.49	-.04
Perceptual Dysregulation	-.24	.23	.20	.13	.19	.27	.39	-.29
Unusual Beliefs	-.15	.10	.10	.15	.10	.16	.23	-.27

Note. *N* = 93.