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Five-Factor Trait Instability in Borderline Relative to Other Personality Disorders

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Abstract

Borderline Personality Disorder (BPD) is related to five-factor model (FFM) traits and can be characterized as involving psychological and behavioral instability. A previous study comparing the FFM trait stability across individuals with borderline and other personality disorders found that the BPD group tended to have lower stability, particularly on neuroticism and conscientiousness and the overall configuration of FFM profiles over 6 years, suggesting that associated psychological and behavioral variability may be due to trait variability. The current study was designed to test the degree to which these findings replicate in another sample using different diagnostic and trait measures and extending the measurement period to 10 years. Results are consistent with previous findings in showing lower differential (rank-order) stability on conscientiousness, greater mean-level decreases on neuroticism, lower individual-level stability on conscientiousness, and lower ipsative stability of trait profile configurations among those with BPD. However, unlike the previous study, no differences were observed for differential or individual-level neuroticism or mean-level conscientiousness. Overall, findings show that the instability characteristic of BPD extends into typically stable personality traits, and that it does so with some specificity in terms of which traits are affected and how instability manifests.

Keywords

Borderline Personality Disorder; Five-Factor Model; Latent Growth Curve Models; Personality Stability

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The DSM-IV (APA, 1994) defines personality disorder (PD) in terms of rigid, pervasive, and inflexible traits. However, the most commonly studied instantiation, borderline PD (BPD), is defined in part by instability in a host of psychological and behavioral domains in the clinical literature (Schmideberg, 1959) and the diagnostic manual. Furthermore, experimental results have shown greater instability in BPD vs. clinical and non-clinical controls with regard to affect (e.g., Russell et al., 2007; Trull et al., 2008), interpersonal behavior (e.g., Hopwood & Morey, 2007; Russell et al., 2007), and self-esteem (Zeigler-Hill & Abraham, 2006), whereas evidence of the greater trait stability indicated by the general PD criteria has not been supported by empirical evidence (Lenzenweger, 2006; Morey et al., 2007). In fact, many BPD symptoms themselves seem to be somewhat unstable (Zanarini et al., 2007).

Personality-based explanations for such variability tend to focus on trait levels. For example, five-factor model (FFM) theorists hypothesize that BPD can be represented by extreme levels of normative traits, primarily including high neuroticism (Samuel & Widiger, 2008; Widiger et al., 2002). Some have further suggested that the variability descriptive of BPD is also indicated by trait levels. For instance, Widiger et al. (2002) noted that “affective

instability is a central feature of (BPD), and the tendency to experience negative affect is a central component of neuroticism" (p. 93). They went on to link FFM trait levels with behavioral and affective instability descriptive of BPD: "the DSM-IV diagnostic criteria provide a variety of examples of this emotional instability…these features correspond closely to the five neuroticism facets of hostility, impulsivity, vulnerability, depression, and anxiety" (p. 93).

Yet levels and variabilities of psychological constructs such as traits, emotions, and behaviors are conceptually and empirically distinct concepts, and these distinctions are meaningful for BPD. For example, Russell et al. (2007) used a 20-day event-contingent sampling method to show that different patterns of affect and interpersonal behavior could differentiate BPD from non-clinical controls, but that patterns varied across level and variability. The BPD group experienced greater levels of unpleasant affect, as would be predicted by high scores on neuroticism. However, they experienced more variability in affective valence and pleasant affect, but not in unpleasant affect. With regard to interpersonal behavior, the BPD group was more submissive and quarrelsome than the non-clinical comparison group, but they were also more variable in overall interpersonal valence and in levels of dominance, agreeableness, and quarrelsomeness. Trull et al. (2008) compared levels of and variability in affect among BPD and depressed controls with an ecological momentary assessment method in which affect was sampled multiple times per day over one month. No differences were observed in levels of affect, but the BPD group was less stable in both pleasant and unpleasant affect over time. Hopwood and Morey (2007) showed that whereas levels of interpersonal traits were not remarkable for BPD patients, these patients could be distinguished by variability in their responses to questions about their interpersonal style. Miller and Pilkonis (2006) compared neuroticism with an index of affective instability composed of PD symptoms, two of which were from the BPD criteria set. They showed different patterns of relations across personality disorders, self- and other-reported interpersonal problems, and prospective outcomes. They concluded that "the tendency to experience chronic negative affective states and the tendency to fluctuate between affective states are, despite some overlap, distinct constructs with significantly different correlates and consequences" (p. 206).

As such, extreme levels on neuroticism and other FFM traits would not appear to fully account for the affective and behavioral instability that characterizes BPD. In this context, Hopwood et al. (in press) hypothesized that variability in FFM traits may augment FFM trait-level depictions of BPD and compared BPD (N = 130) patients to those with other PDs (OPD; N = 302) using data from the Collaborative Longitudinal Personality disorder Study (CLPS). FFM traits were assessed every 2 years for 6 years and group differences were tested across four types of stability (see DeFruyt et al., 2006) a) rank-order stability, or the degree to which the ordering of trait scores was consistent over time, b) mean-level stability, or the degree to which average group scores changed over time, c) individual-level stability, or the variability among individuals within a group in terms of mean-level change, and d) ipsative stability, or the degree to which the overall configural patterning of traits differed over time. At the six-year follow-up, BPD patients showed significantly lower rank-order stability, as indexed by lower retest correlations for neuroticism, conscientiousness, and agreeableness. However, overall the effects of neuroticism and conscientiousness were most consistent across follow-up intervals, whereas the rank-order stability of agreeableness was only significantly lower in one of 6 intervals assessed. Neuroticism and conscientiousness also significantly differed across groups in terms of mean-level and individual-level stability, which were analyzed using multi-level growth curve models. That is, neuroticism increased and conscientiousness decreased more sharply on average in the BPD relative to OPD group, even after controlling for initial trait levels, and there was more variability in change trajectories within the BPD group relative to the OPD group with respect to both of

these traits. Finally, the ipsative configurations of trait profiles, assessed by q correlations across assessment intervals, were significantly less consistent for the BPD group. This finding suggests that the overall patterning of FFM traits was less consistent for the BPD relative to the OPD group. Based on these results, Hopwood et al. argued that personality variability should be distinguished from trait levels in conceptualizing BPD. In particular, they suggested that variability on neuroticism and conscientiousness and in terms of trait configurations may be a more direct explanation for affective and behavioral variability in BPD than extreme trait levels.

However, replication is needed to enhance confidence in these results, and in particular to assure that they were not a function of measurement or analytic methods. Furthermore, no study has yet sampled the stability of traits across BPD and other groups beyond 6 years. Therefore, the current study investigated the differential, mean-level, individual-level, and ipsative stability of FFM traits over 10 years in a sample of BPD and OPD patients in an effort to replicate the findings observed in the CLPS data. Based on results from that study, we hypothesized that BPD would be associated with lower differential, mean-level, and individual-level stability for neuroticism and conscientiousness as well as lower ipsative stability relative to the OPD group, but that these groups would show similar stabilities for the other traits.

Method

Participants were 362 McLean Hospital inpatients diagnosed with BPD (N = 290) or other PDs (N = 72) at baseline from the McLean Study of Adult Development (MSAD; see Zanarini et al., 2003; 2005; 2007 for detailed information about study procedures, which are not given in detail here due to space limitations). All participants were between the ages of 18 and 35 and had IQ scores above the cutoff for mental retardation. Women represented 77% (N = 279) of participants, and 315 (87%) were Caucasian. All patients were fluent in English and had no recorded history of schizophrenia, schizoaffective disorder, bipolar disorder, or organic conditions that could cause psychiatric symptoms. At baseline, the mean socioeconomic status was 3.3 (SD=1.5), where 1=highest and 5=lowest (Hollingshead, 1957), and the mean Global Assessment of Functioning (GAF) score was 39.8 (SD=7.8), indicating major impairment in several areas such as work or school, family relations, judgment, thinking, or mood. Formal consent preceded interview assessment of personality pathology and other clinical variables by masters-level clinicians. The BPD and OPD groups did not differ on age, marital status, or ethnic background, but the BPD group were more neurotic and less extraverted and agreeable at baseline (Morey & Zanarini, 2000).

Measures

The *Revised Diagnostic Interview for Borderlines* (DIB-R; Zanarini, Gunderson, Frankenburg, & Chauncey, 1989) represented the primary diagnostic measure for BPD. This interview was supplemented by the *Diagnostic Interview for DSM-III-R Personality Disorders* (DIPD-R; Zanarini, Frankenburg, Chauncey, & Gunderson, 1987), which assesses all DSM-III-R PDs. At baseline, 4% of the comparison sample met criteria for a Cluster A PD, 33% for a Cluster C PD, and 18% for a Cluster B PD other than BPD (Zanarini et al., 2005). The remaining members of this group met criteria for all but one required criteria for at least two PDs, and were classified as PD not otherwise specified. Participants were placed into BPD or OPD groups based on a cutoff score of eight on the DIB-R and five of nine BPD criteria on the DIPD-R.

The *NEO Five Factor Inventory* (NEO-FFI; Costa & McCrae, 1992) assessed FFM traits. This 60-item self-report measure was assessed at baseline and at 4, 6, 8, and 10-year follow-up assessments. Although retention for this study was quite high over time, with 85%

(N=309) of surviving patients re-interviewed at all follow-up waves, the NEO-FFI was only administered to a very small subsample at year 2 (N = 30) and some missing data occurred for the 4-year NEO-FFI assessment because of funding limitations during those follow-up assessments. As such, the following represent sample sizes at each follow-up for this study (4 year N = 258; 6 year N = 327; 8 year N = 316; 10 year N = 309). Both actual attrition and presence of NEO-FFI follow-up data were unrelated to sex, ethnicity, baseline NEO-FFI scores, or diagnostic group, although there was a slight negative association between the availability of NEO-FFI data across all assessments and age ($t = -2.16$, $p < .05$).

Analyses

As in Hopwood et al. (in press), differences in four kinds of FFM stability were tested across BPD and OPD groups. *Differential stability* reflects the rank-order consistency of trait levels over time, and is indicated by test-retest correlations within traits and across assessments. *Ipsative stability*, which denotes consistency in the configuration or relative prominence of traits across assessments, was examined two ways. First, following Hopwood et al. (in press), q correlations were computed between baseline and follow-up trait profiles. However, given that these correlations could only be computed on five scales as opposed to the 30 facet scales used in the earlier study because the NEO-FFI was used in lieu of the NEO-PI-R (see Costa & McCrae, 1992), they may be somewhat unreliable indicators of ipsative stability differences. To supplement these q correlations, d^2 statistics reflecting the sum of squared differences of trait profiles across baseline and follow-up assessments were computed and compared across groups. Two intervals were of particular interest for investigations of differential and ipsative stability. First, to replicate the CLPS study, differential and ipsative stability was assessed from baseline to 6-year follow-up. Second, to extend these earlier findings, differential and ipsative stability were also assessed from baseline to 10-year follow-up.

Mean-level stability reflects average continuity over time on traits within a group, whereas *individual-level stability* reflects the similarity of such changes among all members of a group. These types of stability correspond to the fixed and random effects of slopes, or temporal changes, in growth curve models. In Hopwood et al. (in press), multi-level models were used to test hypothesized group differences. An alternative structural equation modeling (SEM) approach was used in the current study. Although multi-level and structural equation approaches are mathematically and conceptually similar (Kashy & Donnellan, 2008), we chose the SEM approach because it allows for multiple explicit tests of how well overall model representations fit the observed data as well as a direct comparison of models in which groups are hypothesized to differ on a particular parameter with the familiar single degree of freedom χ^2 test.

Thus, growth curve models characterizing FFM trait change at baseline and 4, 6, 8, and 10-year assessments were constructed in an SEM framework with maximum-likelihood estimation in AMOS 17.0 (see Figure 1). Following Preacher, Wichman, MacCallum, and Briggs (2008), we fixed the residual variances for all indicators to the same value. The baseline slope coefficient was fixed to zero whereas the 10-year follow-up coefficient was fixed to 1 so that the intercept factor represented initial levels of personality and the shape factor represented individual differences in change over time from baseline to the 6^{th} year follow-up (Duncan, Duncan, & Stryker, 2006). Study hypotheses were tested by assessing the change in χ^2 associated with constraining particular parameters to be equal across groups. Three parameters were constrained in this way. First, to test the common observation regarding mean differences in FFM traits, the intercept mean was held constant across groups. Second, to test the hypothesis of greater mean-level change in BPD, the slope mean was held constant. To test the hypothesis of lower individual-level stability for BPD patients, the slope variance was held constant.

Results

Differential stability results are given in Table 1. Over the 6-year assessment interval, the BPD group was significantly less stable on openness and conscientiousness than the OPD group. Although the groups differed in the expected direction on neuroticism, this difference was not statistically significant. Over the 10-year assessment interval, only conscientiousness showed significant differences, with BPD individuals being significantly less consistent than those with other PDs.

Latent growth curve model results are given in Table 2. All models demonstrated acceptable fit according to RMSEA and CFI values. Overall, baseline values for all patients were higher on neuroticism (baseline Cohen's $d = 1.82$) and openness to experience ($d = .47$) than community sample norms (Costa & McCrae, 1992), and were lower on extraversion ($d = -.70$), conscientiousness ($d = -.88$), and agreeableness ($d = -.35$); intercept mean difference tests corroborated an earlier report (Morey & Zanarini, 2000) in showing that the BPD group was more neurotic, introverted, and disagreeable than the OPD group at baseline. In terms of mean-level change, only neuroticism showed significant hypothesized slope differences across groups according to the χ^2 difference test (Table 2). In addition to the BPD group starting with a higher score on this trait and both groups having meaningful negative slopes, neuroticism declined more sharply in the BPD sample (slope mean = −6.92, S.E. = .57, 10-year Cohen's d = .84) than in the OPD sample (−4.50, S.E. = 1.07, d = .45). We had hypothesized that conscientiousness would also change at different rates across groups. However, the χ^2 difference test was not significant for this trait, suggesting that the slope mean in the BPD group (2.22, S.E. = .45) did not significantly differ from the corresponding value in the OPD group (3.21, S.E. = .72). Significant fixed effect slope differences were not observed on the other three FFM traits.

Individual-level stability differences were also tested with growth curve models. As with differential and mean-level stability, we had hypothesized group differences for neuroticism and conscientiousness but no other traits. Data were consistent with the study hypothesis for conscientiousness: the BPD group (variance = 25.11, S.E. = 5.20) demonstrated greater individual-level variability than the OPD group (5.79, S.E. = 5.81), and a significant decrement in fit was observed with this random effect constrained to be equal across samples (Table 2). However, hypothesized differences were not observed for neuroticism (BPD variance = 33.63, S.E. = 7.14; OPD variance = 31.40, S.E. = 13.26). No statistically significant decrement in fit was observed when this random effect was constrained to be equal across groups for the other three traits.

Finally, ipsative stability differences were tested by comparing the q correlations of NEO-FFI profiles over the 10-year interval for the OPD and BPD groups. These values were .53 for the BPD group and .63 for the OPD group at 6 years and .46 for the BPD group and .54 for the OPD group for the ten-year interval. Differences were tested by transforming these coefficients to Fisher's z scores and conducting independent samples t-tests; neither difference was statistically significant. However, given that the difference across these groups was of the same magnitude (i.e., .08) as was observed in a 6-year lag in a previous study with similar groups but using NEO-PI-R facets and a larger comparison sample, this failure to achieve statistical significance may have been due to statistical power. To supplement these analyses, a d^2 coefficient reflecting the sum of squared deviations across traits over time was compared across groups. This test suggested that the BPD group was significantly less stable in trait configurations over time than the OPD group ($t = 2.18$, $p < .01$).

Discussion

It is well-documented that BPD can be characterized, in part, by a pattern of FFM trait levels (e.g., Samuel & Widiger, 2008). However, extremes in these trait levels may not fully capture the essence of BPD; in particular these levels may be limited in their ability to depict the psychological and behavioral instability that is symptomatic of the disorder. Rather, instability in these traits may importantly increment trait levels in characterizing the behavioral, emotional, and self-related variability associated with BPD. Data from this study and a previous similar effort are generally consistent with this hypothesis. BPD patients tend to be less stable over time on some FFM traits and in trait configurations than patients with other PDs. However, this instability is not pervasive across traits. In both CLPS and MSAD data, where greater instability among those with BPD occurred, it involved neuroticism, conscientiousness, and configural trait patterns.

However, whereas several specific effects replicated across CLPS and MSAD samples, some did not. In both studies, BPD individuals showed more rank-order inconsistency in conscientiousness than those with other PDs. This suggests that changes in conscientiousness will be less predictable for BPD individuals than for others. Unlike in the previous study, neuroticism did not show lower rank-order consistency over time for the BPD group relative to the OPD group. Several factors may have contributed to differential stability effect differences across studies. At 6 years, this difference may have been partly accounted for by statistical power given the larger CLPS comparison sample. However, corresponding stability differences were larger in the CLPS (.20) than MSAD (.10) samples, suggesting that power to detect statistically significant effects was not the only factor limiting replication. The use of the NEO-FFI, a briefer version of the NEO-PI-R used in the CLPS study, may have generally contributed to lower stability estimates for FFM traits, given its lower reliability (Costa & McCrae, 1992), and this may have limited sensitivity to group differences. Comparison group differences may have also contributed to this inconsistency, although the diagnostic and demographic similarity of the OPD sample across studies suggests that this is unlikely. In any case, this inconsistency of findings across studies suggests that future research should continue to explore differences between BPD and other PDs, as well as samples characterized by other psychiatric conditions or a lack of mental disorders, in terms of the rank order consistency of neuroticism and other FFM traits over time.

Both convergence and divergence were also observed across studies in terms of mean-level change. Neuroticism differentiated BPD from OPD patients and declined more dramatically for those with BPD than with other PDs in both studies, suggesting that clinicians can expect neuroticism to be particularly high for anyone diagnosed with BPD, but also that they can expect a steeper decline in neurotic characteristics over time in BPD relative to OPD patients. Yet hypothesized differences were not observed on conscientiousness. However, although conscientiousness has been consistently linked to BPD in other studies (Samuel & Widiger, 2008), it did not differentiate groups in the MSAD data (Morey & Zanarini, 2000), perhaps suggesting that this lack of differences related to the NEO-FFI representation of this trait. Because conscientiousness is a multifaceted construct that incorporates concepts such as constraint, dutifulness, organization, and achievement-striving, this finding may suggest that the elements of conscientiousness that are most related to BPD are not well-assessed by the NEO-FFI relative to the NEO-PI-R. In any case, this failure to replicate suggests the need for further research on mean changes in conscientiousness in BPD relative to other groups.

With regard to individual-level stability, the BPD group had significantly greater variability in individual-level change on conscientiousness in both samples. This finding suggests a

wider potential trajectory for BPD relative to OPD patients, in that some individuals with BPD might be anticipated to increase on this trait substantially over time, whereas others may stay the same or even decrease. Given the relation of this trait to functioning among people with PDs (Hopwood et al., 2007, 2009), it might be particularly important to determine which BPD patients are likely to change and which ones are not. Similarly, this result implies that identifying moderators of change on conscientiousness, such as clinical interventions, represents an important area for further study. However, whereas the BPD group showed more individual-level change on neuroticism in the CLPS sample, the slope variance was nearly identical across BPD and OPD groups for neuroticism in these data. This failure to replicate suggests the need for further investigation on individual-level instability of neuroticism as a characteristic of BPD.

These findings carry integrate two lines of research that had formerly been mostly separate. One line involves the consistent demonstration that, relative to a variety of clinical and non-clinical comparison groups and consistent with DSM-IV diagnostic criteria, individuals with BPD are less stable emotionally, interpersonally, and in terms of self-esteem than members of other diagnostic groups or non-clinical controls. The other line shows reasonably consistent relations of BPD to FFM traits (Samuel & Widiger, 2008). Demonstrating that BPD individuals are also less stable in terms of FFM traits extends investigations of BPD instability into the domain of personality, and extends investigations of FFM traits in BPD by suggesting that the disorder can be characterized by both trait levels and trait variabilities (see Block, 1995).

Understanding the causal direction of these observed associations is an important next step for understanding relations among BPD and personality traits. One possibility is that instability in the affect or behavior of BPD individuals contributes to greater error in personality measurement, which contributes to data suggesting less stable traits. An alternative hypothesis implicates personality trait instability as causal of more transient and circumscribed types of stability among people with BPD. Thus, delineating the mechanisms of instability, at the levels of traits and more dynamic processes, represents an important area for future research.

Several study limitations may have affected these findings. The potential effects of using a brief measure of FFM traits were discussed above. Future studies should employ other measures of traits, particularly including those that are gathered by interview or informants given the reliance on self-report measurement of these traits in both this study and Hopwood et al. (in press). The use of DSM-III criteria for PD also represents a potential study limitation. Other limitations relate to the samples. The composition of the comparison group was sufficiently similar to that of a previous study to allow for meaningful comparisons. Furthermore, the use of a clinically severe comparison group permits a very strong test regarding the specificity of trait variability to BPD, given that trait variability may be generally associated with personality immaturity and dysfunction (Donnellan, Conger, & Burzette, 2007) as indicated by having any PD. However, further research is needed with different kinds of comparison groups, such as those with psychiatric disorders other than PDs. Such comparisons would likely provide more power to detect differences, would serve to generalize these effects, and may suggest different patterns of instability that characterize other disorders. In addition, the comparison sample in this study was relatively small. Although this did not appear to negatively affect the ability to model change in FFM traits, it may have limited power to find differences across groups. Although concerns about the reliability of significant effects is allayed somewhat by direct comparisons with a similar study in a different sample, future research with larger samples is needed to replicate and extend these findings. Finally, future research should assess whether trait variability

increments trait levels in depicting behavioral, emotional, or other kinds of variability, as would be implied by but was not tested directly in this study.

In conclusion, studies in two longitudinal samples have now demonstrated that BPD can be differentiated from other PDs in terms of particular kinds of FFM trait instability. This may imply that this variability, and not necessarily extreme levels of certain traits, contributes to the psychological and behavioral instability characteristic of the disorder. In particular, findings from both studies implicate greater mean-level change on neuroticism, greater rank-order and individual-level instability for conscientiousness and greater instability in the configuration of trait profiles in BPD relative to other PDs. In addition to further replication, research on the mechanisms of observed instability at the level of traits and more dynamic processes is needed to better characterize BPD.

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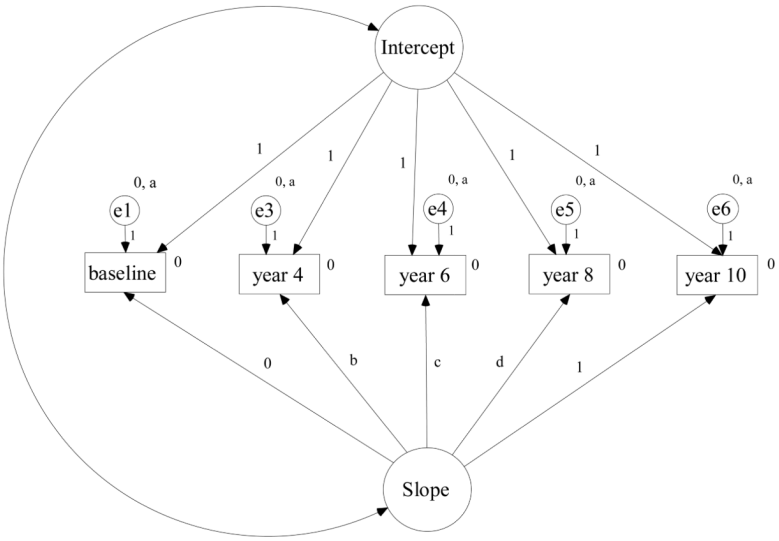

Figure 1. SEM Growth Curve Model

Note. This model was constructed in AMOS 17.0. Letter a indicates that error variances were constrained to be equal across measurement occasions. Letters b-d indicate paths that were constrained to be equal across groups.

Table 1

Six and ten-year FFM differential stability in BPD and OPD groups.

Trait	Full Sample	Borderline	Other PD
6 Years	*N = 327*	*N = 264*	*N = 63*
Neuroticism	.48	.40	.53
Extraversion	.61	.60	.61
Openness*	.68	.65	.79
Agreeableness	.60	.58	.63
Conscientiousness*	.54	.51	.68
10 Years	*N* = 309	*N* = 249	*N* = 60
Neuroticism	.38	.34	.28
Extraversion	.52	.52	.48
Openness	.65	.64	.73
Agreeableness	.59	.58	.59
Conscientiousness*	.53	.49	.74

* $p < .05$

Table 2

Growth curve model coefficients depicting differences in mean-level and individual-level FFM trait change in BPD and OPD groups.

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
			Goodness of Fit		
$\chi^2_{(26)}$	76.880*	25.935	42.579*	54.114*	45.242**
RMSEA	.074	.000	.042	.055	.045
90% CI	.055–.093	.000–.041	.016–.064	.034–.075	.022–.067
CFI	.925	1.000	.986	.966	.977
			Group Invariance $\chi^2_{(1)}$ Difference Test		
Intercept Mean	49.301*	12.434*	.986	7.586*	.006
Slope Mean	4.115*	1.876	.531	1.190	1.440
Slope Variance	.023	.015	2.430	2.214	5.208*

*$p < .05$

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