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The Utility of the Unified Protocol in Treating Borderline Features

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Abstract

Borderline personality disorder (BPD) is characterized by maladaptive levels of neuroticism, agreeableness, and conscientiousness. The Unified Protocol (UP), a treatment for neuroticism, has previously demonstrated promising effects when applied to BPD; however, not all individuals with BPD respond, suggesting the UP may be incomplete for some BPD presentations. This secondary analysis explored the extent to which adapted versions of UP represent an efficacious treatment approach for BPD symptoms. Data from a subset of twelve participants with clinically-significant BPD features were included. We explored within-group changes in BPD symptoms and differences in within-person changes in BPD scores based on patients' personality profiles. The UP resulted in improvements in BPD symptoms that were moderate in magnitude, Hedges's $g = 0.48$, 95% CI [0.35, 0.62]. Individuals with personality profiles characterized by high neuroticism and low conscientiousness exhibited early gains in the UP but did not sustain them, whereas those with at least moderate levels of conscientiousness generally continued to improve across 12 weeks. Possible explanations and limitations were discussed.

Keywords Borderline Personality Disorder · Unified Protocol

The Unified Protocol (UP; Barlow et al., 2011) is a transdiagnostic treatment that targets common mechanisms implicated in the development and maintenance of a range of emotional disorders (e.g., anxiety, depressive, and related disorders; Barlow, 1991; Cassiello-Robbins et al., 2020). Specifically, the UP was designed to address (1) frequently occurring negative emotions (neuroticism), (2) aversive reactions to these emotional experiences, and (3) efforts to avoid or suppress them. By targeting aversive reactivity to a wide variety of negative emotions when they occur, the UP may reduce reliance on the avoidant coping that exacerbates negative emotionality. As negative emotions become less frequent over time, and when these changes are sustained, these behavioral and emotional changes may constitute decreases in neuroticism (Magidson et al., 2014). Indeed, the UP is associated with significant decreases in aversive reactions to emotions (Eustis et al., 2020; Sauer-Zavala et al., 2012), as well as neuroticism (Carl et al., 2014; Sauer-Zavala et al., 2020). This treatment has also demonstrated efficacy in addressing a range of emotional disorders, such as generalized and social anxiety disorder, bipolar disorder, obsessive compulsive disorder, and depressive symptoms (Cassiello-Robbins et al., 2020; Sakiris & Berle, 2019).

The UP may also be a useful approach for individuals with borderline personality disorder (BPD; see Sauer-Zavala et al., 2016). Specifically, Linehan (1993) describes BPD as chiefly characterized by emotional vulnerability (i.e., emotional intensity, reactivity, and slow return to baseline functioning) that is akin to the neurotic temperament. Indeed, there is ample empirical evidence to suggest that individuals with this condition demonstrate high levels of neuroticism relative to other clinical and healthy samples (Larstone et al., 2002; Morey, 1991; Samuel & Widiger, 2008; Saulsman & Page, 2004; Widiger et al., 2013). Additionally, individuals with BPD exhibit aversive reactions to negative emotions (the primary target of the UP) that lead to the use of emotionally-avoidant coping strategies (Roemer et al., 2005). The actions that constitute the behavioral dysregulation included in the diagnostic criteria for BPD (e.g., self-injurious behavior, substance use, risky sex, reckless spending) have been shown to function as behavioral

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avoidance from unwanted negative emotions (Aldao & Nolen-Hoeksema, 2010; Moore et al., 2008; Tull & Roemer, 2007; Turk et al., 2005).

Several small studies have examined the utility of the UP for patients diagnosed with BPD. For example, results from one study showed significant reductions in BPD symptoms and increases in emotion-regulation capacity for four out of five patients with mild to moderate BPD symptoms who completed a course of treatment with the UP (Sauer-Zavala et al., 2016). Similarly, in another study, Lopez and colleagues (2015) showed that six out of eight participants with BPD who received the UP no longer met diagnostic criteria for this condition at one-week follow-up. Some patients in this sample also demonstrated improvements in co-occurring symptoms of anxiety and depression (Lopez et al., 2019). More recently, Tonarely and colleagues (2020) described a case study using the UP to treat an adolescent patient with borderline features. This course of treatment resulted in a clinically significant decrease in borderline features, as well as in anxiety and depressive symptom severity, from pre-treatment to post-treatment.

Despite the UP's promise as a short-term treatment for BPD, some patients in these studies did not experience clinically significant improvements. For example, symptoms worsened for one of the cases in Sauer-Zavala et al.'s (2016) study. The authors noted that this patient was more impulsive and displayed greater suspiciousness of others relative to the rest of their sample. The authors then speculated that the UP may not be as adept in addressing these specific symptoms of BPD. Similarly, in Lopez and colleagues' (2015) sample, two of the eight participants continued to meet diagnostic criteria for BPD despite demonstrating remission for comorbid panic disorder and specific phobia diagnoses. This pattern of results suggests that UP's emotion-focus may be sufficient for some presentations of BPD (i.e., those with symptoms mediated by high levels of neuroticism) but may be incomplete for others.

Differing treatment responses amongst patients with BPD may be due to the high heterogeneity of this condition. According to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5; American Psychiatric Association [APA], 2013), an individual must endorse five of nine possible diagnostic criteria to be diagnosed with BPD, resulting in two hundred fifty-six possible combinations of symptoms for the same diagnosis (APA, 2013). This heterogeneity may be due to several discrete psychopathological mechanisms, beyond neuroticism/emotional dysfunction, accounting for the development of BPD (e.g., insecure attachment, impulsivity); and if treatments are not engaging the maintaining factors relevant for an individual patient with BPD, they may be less likely to respond. For example, some individuals may engage in impulsive behaviors (e.g., binge-eating, substance use, non-suicidal self-injury) as a means to regulate extreme negative emotions (Stanley & Singh, 2018), whereas others may engage in these behaviors due to trait impulsivity. Thus, for some individuals with high levels of trait impulsivity, addressing negative affect alone (i.e., without targeting impulsivity) may not significantly reduce BPD behavioral dysfunction.

It is important to note that these psychopathological mechanisms for BPD (i.e., emotion dysfunction, attachment insecurity, impulsivity) may not be mutually exclusive. The Five Factor Model (FFM; Costa & McCrae, 1995) of personality may provide a way to characterize an individual's personality-based risk. The FFM divides personality into five dimensional traits, including extraversion, or the tendency to be outgoing and sociable, neuroticism, the frequent and intense experience of negative emotions, openness to experience, or the willingness to try new activities, agreeableness, or the quality of being friendly and cooperative, and conscientiousness, or the ability to evaluate consequences of one's behavior. Personality disorders are thought to emerge as a result of extreme degrees of these traits (Widiger et al., 2009, 2013). Factor analytic studies (e.g., Mullins-Sweatt et al., 2012) suggest that BPD may be reflected as high levels of neuroticism and low levels of agreeableness (corresponding to the attachment-based perspective of BPD) and conscientiousness (corresponding to trait impulsivity observed in BPD). This personality structure of BPD is consistent with other dimensional models of psychopathology. For example, the alternative model of personality disorders in DSM-5 (APA, 2013) characterizes BPD by facets of negative affectivity, disinhibition (i.e., impulsivity), and psychoticism (i.e., aggression and aloofness). Similarly, in the Hierarchical Taxonomy of Psychopathology (HiTOP; Kotov et al., 2017), BPD is considered to be located on both the internalizing and antagonistic externalizing spectrums.

These classification systems can produce a dimensional profile that can be used to develop a personalized treatment plan based on the mechanisms maintaining an individual patient's BPD symptoms. For instance, a patient with elevations largely confined to neuroticism subscales will likely benefit from the UP, whereas a patient who also exhibits low agreeableness and conscientiousness (not explicitly targeted by the UP) may need additional treatment components.

Current study. The primary aim of the current study was to investigate the extent to which the adapted versions UP represents a helpful treatment approach for decreasing borderline symptoms. Data were drawn from a sequential multiple assignment randomized trial (SMART; Sauer-Zavala et al., 2022) in which patients were randomized to receive UP modules in personalized sequences (i.e., prioritizing skill strengths, compensating for skill deficits) or in the standard

order. Patients were also randomized to receive either 6 (Brief Condition; a subset of UP modules) or 12 sessions (Full condition; all UP modules). We focused on the subset ($N = 12$) of patients in this trial who exhibited clinically-significant BPD features. Given previous pilot work exploring the UP's effect on BPD symptoms (reviewed above), we hypothesized that this intervention would result in significant improvement in BPD symptoms. Additionally, we sought to examine whether specific BPD domains were more apt to improve across a course of care with the UP. Given the UP's focus on emotion dysfunction, we hypothesized that we would observe a larger effect for reductions in emotional difficulties relative to identity problems, relationship problems, and impulsivity. Lastly, we explored whether there were differences in within-person change in borderline features scores during treatment based on patients' FFM profiles at baseline. We hypothesized that the largest improvements following treatment with the UP would be exhibited by individuals with FFM profiles characterized by high neuroticism and at least moderate levels of agreeableness and conscientiousness. In contrast, we anticipated that those with low levels of agreeableness and/or conscientiousness would demonstrate minimal improvements following treatment with the UP.

Method

Participants

Participants included in this study were drawn from a sequential multiple assignment randomized trial (SMART), which was designed to determine the feasibility and efficacy of sequencing the UP modules based on individual's strengths or weaknesses; and whether terminating the treatment prior to delivering the full package would show comparable results to the full treatment. The SMART's treatment-seeking participants were recruited from the community via online advertisements and their inclusion criteria consisted of being at least 18 years of age and meeting DSM-5 (APA, 2013) criteria for an emotional disorder (i.e., anxiety, depressive, obsessive-compulsive, and trauma-related disorders). Participants were excluded if they experienced mania within the past year, presented with acute suicide risk, met criteria for a substance use disorder within the past three months, or had ever experienced delusions or hallucinations. Additionally, participants who attended at least five sessions of cognitive behavioral therapy (CBT) in the last five years were excluded. Participants were asked to discontinue any other psychiatric treatment they might have been receiving before the start of the study and agree to maintain a steady dose of their medication throughout study participation (i.e., from the time they consented to the study).

A subset of participants ($n = 12$, 17.1%), who presented with significant BPD features (i.e., individuals with pre-treatment Personality Assessment Inventory-Borderline Features Subscale [PAI-BOR; Morey, 1991] total scores ≥ 38 [equivalent to 70T in census-matched standardization sample]) were included in the current study. The twelve participants ($M_{age} = 27.1$, $SD = 8.2$) were mostly female (75.0%) and Caucasian (75.0%). Participants in our subsample were compared to the full sample via independent samples t tests for differences in age and education level, and χ^2 tests of independence for gender identity, race/ethnicity, relationship status, and sexual orientation. No differences were found except for age where the participants who presented significant BPD features were significantly younger ($M_{diff} = 8.0$).

Measures

The Diagnostic Interview for Anxiety, Mood, and Obsessive-Compulsive and Related Neuropsychiatric Disorders (Tolin et al., 2018) was used to assess DSM-5 diagnoses for inclusion/exclusion criteria at baseline. The DIAMOND is a semi-structured interview that assigns categorical DSM-5 diagnoses and dimensional severity ratings (CSRs), using a scale between 1 (normal) and 7 (extreme). Trained assessors demonstrated excellent reliability on categorical ratings of primary diagnoses (Krippendorff's αs: 0.91 − 1.00; median = 1.00) and CSRs of each disorder (Krippendorff's αs: 0.83 − 1.00; median = 0.92) in the parent trial.

Borderline personality disorder symptoms were assessed with the Borderline Features Subscale from the Personality Assessment Inventory (PAI-BOR; Morey, 1991) at baseline and all follow-up timepoints. This 24-item self-report scale provides a total symptom score, as well as subscales for emotional problems assessed by affect instability subscale (PAI-BOR-AI), relationship problems assessed by the interpersonal relationships subscale (PAI-BOR-IR), identity problems assessed by identity disturbance subscale (PAI-BOR-ID), and impulsivity assessed by the self-harm subscale (PAI-BOR-SH). Score of ≥ 70T may suggest a diagnosis of BPD only if "there are prominent elevations on most of the BOR subscales because individual features are common to other disorders" (PAI-BOR; Morey, 1991). The internal consistency of PAI-BOR items in the parent study at baseline was acceptable (McDonald's ω = 0.64).

The FFM domains were assessed by the NEO Five-Factor Inventory (NEO-FFI; McCrae & Costa, 2004) at baseline and all follow-up timepoints. The NEO-FFI is a 60-item self-report measure with subscales for neuroticism, extraversion, agreeableness, conscientiousness, and openness.

The items are rated on a 5-point Likert scale, ranging from strongly disagree to strongly agree. The internal consistency of NEO-FFI items on the neuroticism subscale in the parent study at baseline was good (McDonald's $\omega = 0.82$). Internal consistency of NEO-FFI items in the parent study at baseline on all other FFM subscales were acceptable to excellent (McDonald's ω's ≥ 0.60).

Procedures

Procedures for the parent trial were approved by the University of Kentucky Institutional Review Board. The study procedures were explained to participants and informed consent was obtained prior to the start of the study. Following a baseline assessment conducted by trained assessors at pre-treatment, participants were randomized to either receive the standard delivery of the UP, compensation delivery in which the UP modules were sequenced based on participants' weaknesses, or capitalization delivery in which the UP modules were sequenced based on participants' strengths. After the fifth treatment session, a second battery of assessments was administered to participants who then underwent a second-stage randomization in which they were assigned to receive Brief (6 sessions) or Full (12 sessions) Treatment conditions. At the end of the Full Treatment, the last battery of assessments was administered to all participants, regardless of the length of the treatment they received, resulting in three major timepoints. All study data were collected and managed using Research Electronic Data Capture (REDCap) tools hosted at University of Kentucky (Harris et al., 2009, 2019).

Analytic Approach

Characterizing change in BPD symptoms during treatment with the UP. In the case of missing data, multiple imputations in SPSS Version 27.0 (IBM., 2020) was performed. Twenty-five datasets were created, using a fully conditional specification (FCS; Van Buuren et al., 2006). Data were collapsed across treatment sequencing conditions due to the lack of significant differences in changes in clinical severity across people assigned to the standard, compensation, or capitalization deliveries (Sauer-Zavala et al., 2022). Descriptive statistics and primary analyses were conducted in SPSS Version 27.0 (IBM Corp., 2020). To test the hypotheses regarding the effect of UP treatment on the total BPD score and its subscales, Hedges's *g* was calculated in the subset with significant BPD features. Hedges's *g* allows for the examination of the magnitude of change from the baseline assessment to the second assessment (after five sessions of treatment), from baseline to the third assessment, and from the second assessment to the third assessment[1]. The Hedges's *g* is a preferable approach for analyses of treatment studies because it gives an unbiased estimate of the population effect size and is appropriate for small sample sizes (Lakens, 2013). Additionally, between group effect sizes, using Hedges's *g*, were calculated for BPD symptoms at third assessment, comparing individuals assigned to the Full and Brief Treatment conditions. Hedge's *g* is interpreted using the same standards as Cohen's *d* (i.e., 0.2, 0.5, and 0.8 reflecting small, medium, and large effects, respectively) and change on variables of interest are considered statistically significant if the confidence intervals do not include zero.

FFM dimensions as predictors of borderline symptom improvement. We conducted exploratory analyses to investigate whether baseline FFM profiles among the subset of individuals with BPD features were related to within-participant change on borderline features across assessments. First, we examined within-participant change on BPD symptoms from pre-treatment to assessment 2 and from pre-treatment to assessment 3. Significance of within-participant change was evaluated by calculating a 95% confidence interval (CI) around observed change scores to determine reliability of changes (see: Au et al., 2017); Jacobson and Truax's (1991) method was used for calculating standard error of the difference (Sdiff). S_{diff} was then multiplied by 1.96 to create a 95% confidence interval (CI) around each change score. When this 95% CI does not include zero, change is considered statistically significant. Participants were categorized into two groups: (1) high neuroticism (at least average agreeableness and conscientiousness), and (2) low agreeableness and/or low conscientiousness. High ($T > 55$) and low ($T < 45$) levels on these domains were determined by computing *t*-scores for each participant's raw score, using normative data from the NEO-FFI-3 professional manual (Costa & McCrae, 1992). Finally, we examined the proportion of participants in each personality profile group who demonstrated reliable change on our measure of BPD symptoms.

Results

Characterizing Change in BPD Symptoms during Treatment with the UP

Means, standard deviations, and within-condition effect sizes (Hedge's *g*) for the PAI-BOR and each of its subscales

[1] All participants received treatment between baseline and second assessment (A2). After A2, participants were randomized to either discontinue after their 6th session or after their 12th session. Thus, some participants received a single additional session between A2 and A3 and some received 7 additional sessions.

can be viewed in Table 1. The change was in the expected direction from baseline to assessment 2 (i.e., following 5 sessions of UP treatment) and from baseline to assessment 3 (i.e., following 12 sessions for patients in the Full treatment condition and following 6 sessions and a 6 week follow-up period for patients in the Brief treatment condition). Reductions in the PAI-BOR total score between baseline and assessment 2, Hedges's g = 0.49, 95% CI [0.36, 0.62], and between baseline and assessment 3, Hedges's g = 0.48, 95% CI [0.35, 0.62], were significant and moderate in magnitude, whereas small to moderate significant reductions were observed for the PAI-BOR subscales at these timepoints, Hedges's gs: 0.23, 0.47, ps < 0.01, with the exception of relationship subscale. No significant reductions were observed in the PAI-BOR total score and subscales between assessments 2 and 3, except for the identity problems subscale which demonstrated additional small significant reductions, Hedges's g = 0.12, 95% CI [0.04, 0.20].

Hedges's g was also calculated to determine the degree of difference on BPD symptoms between the Full and Brief Treatment conditions. In line with expectations, there were no significant differences between conditions at baseline (when no treatment had been administered to either condition) or at assessment 2 (when patients in both conditions had received 5 UP sessions), with two exceptions. Patients in the Full Treatment condition reported significantly lower symptoms of emotional problems than those in the Brief Treatment condition at assessment 1, Hedges's g = 1.51, 95% CI [0.07, 2.88]; however, by assessment 2, these differences were no longer significant, Hedges's g = 0.79, 95% CI [–0.47, 2.01]. Similarly, patients in the Full Treatment condition reported significantly lower symptoms of identity problems at assessment 2 relative to patients in the Brief Treatment condition, Hedges's g = 1.95, 95% CI [0.37, 3.44]. With regard to our comparison of substantive interest, comparing BPD symptoms at assessment 3 for patients who completed a full 12 sessions and patients who completed 6 sessions and a 6-week follow-up period, there were no significant differences between groups. Differences between individuals in the Full Treatment condition and Brief treatment condition on overall BPD symptoms, Hedges's g = 0.72, 95% CI [–0.53, 1.92], emotional problems, Hedges's g = 0.60, 95% CI [–0.63, 1.78], and relationship problems, Hedges's g = 0.52, 95% CI [–0.70, 1.70], were moderate in magnitude, along with large differences for identity problems, Hedges's g = 1.26, 95% CI [–0.11, 2.56], favoring patients who received all 12 sessions. However, confidence intervals for these effects included zero, indicating that there were no statistically significant differences in the length of the treatment received.

Table 1 Within Participant Effect Sizes for change in BPD Symptoms in BPD Subset Samples

	BL		A2		BL to A2		A3		BL to A3		A2 to A3	
	M	*SD*	*M*	*SD*	Hedges' *g*	95% CI	*M*	*SD*	Hedges' *g*	95% CI	Hedges' *g*	95% CI
BPD Symptoms	44.42	4.36	41.66	6.43	0.49**	[0.36, 0.62]	41.12	8.16	0.48**	[0.35, 0.62]	0.07	[-0.03, 0.18]
Subscales												
Emotional Problems	12.08	2.18	11.44	3.04	0.23**	[0.13, 0.34]	11.10	3.16	0.35**	[0.23, 0.47]	0.11	[0.02, 1.20]
Relationship Problems	11.25	3.90	11.41	3.00	-0.05	[-0.17, 0.08]	11.59	3.06	-0.10	[-0.24, 0.05]	-0.06	[-0.16, 0.05]
Identity Problems	13.08	2.18	11.95	3.41	0.38**	[0.26, 0.49]	11.50	3.84	0.47**	[0.35,0.59]	0.12*	[0.04, 0.20]
Impulsivity	8.00	4.01	6.86	3.32	0.30**	[0.21, 0.40]	6.93	3.77	0.28**	[0.19, 0.36]	-0.02	[-0.09, 0.05]

Note. *p < .01. **p < .001

FFM Dimensions as Moderators of BPD Symptom Improvement

For our exploratory analyses investigating whether FFM profiles were related to within-individual change on BPD symptoms, using normative data from the NEO-FFI-3 professional manual, all patients in the BPD subsample were categorized as exhibiting high neuroticism scores, whereas six patients *also* endorsed low levels of conscientiousness. Of note, no patients in our sample were classified as exhibiting low agreeableness.

Within-individual change on BPD symptoms for our BPD subsample are depicted in Table 2. Shaded rows represent individuals classified as exhibiting high neuroticism *and* low conscientiousness, whereas non-shaded rows represent those who endorsed high neuroticism only. Across all 12 individuals, only three patients reported statistically significant change scores between assessments; however, one of these participants' total BPD score increased from baseline to second assessment, and from second assessment to third (see participant 7). Participant 3, who was in Full Treatment condition, reported a reduction of 14 points in their overall BPD scores from baseline to assessment 2 (statistically significant), but reported 3 points increase at assessment 3, rendering their improvement no longer significant. Participant 11, from Brief Treatment condition, reported significant decrease in their total BPD scores at assessment 3. Overall, all individuals, except one (see participant 1), with significant borderline features who displayed high neuroticism and low conscientiousness did not maintain their improvements at assessment 3. Whereas two participants (see participant 5 and 7) who displayed high neuroticism *without* low levels of conscientiousness did not improve their BPD scores at assessment 2 and 3.

Discussion

The purpose of the present study was to explore the utility of personalized adaptations of the Unified Protocol (UP), as well as standard-delivery UP, for people with borderline personality disorder (BPD). We also explored whether there are personality factors that may affect BPD symptom improvements during treatment. Patients with principal

Table 2 Within-Individual Change in BPD Symptoms for the Subsample with Significant Borderline Features

	BPD Symptoms 95% CI = *CS* ± 11.52				
	Pre-treatment (A1)	*Post-treatment (A2)*	*Post-treatment (A3)*	*Change Score A1-A2 (95% CI)*	*Change Score A1-A3 (95% CI)*
Patient 1†,‡	45.00	41.00	34.00	-4.00 (-15.52, 7.52)	-11.00 (-22.52, 0.52)
Patient 2†,‡	50.00	42.00	51.00	-8.00 (-19.52, 3.52)	1.00 (-10.52, 12.52)
Patient 3†,‡	42.00	28.00	31.00	-14.00* (-25.52, -2.48)	-11.00 (-22.52, 0.52)
Patient 4†	42.00	35.00	32.00	-7.00 (-18.52, 4.52)	-10.00 (-21.52, 21.52)
Patient 5†	42.00	42.08^	41.28^	0.08 (-11.44, 11.60)	0.72 (-10.80, 12.24)
Patient 6†,‡	39.00	40.92^	40.52^	1.92 (-9.60, 13.44)	1.52 (-10.00, 13.04)
Patient 7	42.00	53.00	54.00	11.00 (-0.52, 22.52)	12.00* (0.48, 23.52)
Patient 8‡	44.00	40.00	45.00	-4.00 (-15.52, 7.52)	1.00 (-10.52, 12.52)
Patient 9‡	49.00	42.00	49.00	-7.00 (-18.52, 4.52)	0.00 (-11.52, 11.52)
Patient 10	54.00	51.00	46.00	-3.00 (-14.52, 8.52)	-8.00 (-19.52, 3.52)
Patient 11	45.00	44.00	29.00	-1.00 (-12.52, 10.52)	-16.00* (-27.52, -4.48)
Patient 12	39.00	40.92^	40.60^	1.92 (-9.60, 13.44)	1.6 (-9.92, 13.12)

Note. †Patient was in full treatment condition. *Denotes significant change score. ^Data derived from multiple imputations. ‡Denotes participants with high neuroticism and low conscientiousness. The confidence intervals were computed using data from the clinical sample in the PAI Professional Manual 2nd Edition. The high and low values of neuroticism, agreeableness, and low conscientiousness domains were computed from the normative data of the NEO-FFI-3 professional manual.

anxiety (social anxiety disorder, generalized anxiety disorder, panic disorder), depressive (major depressive disorder, persistent depressive), or related (obsessive-compulsive disorder, posttraumatic stress disorder) disorders received 6 or 12 sessions of the UP.

A subset of our sample (12 individuals) presented with significant borderline features. Given that previous research has demonstrated significant improvements in BPD symptoms during treatment with the UP (e.g., Lopez et al., 2015; Sauer-Zavala et al., 2016), we anticipated similar effects in this study. Among participants who presented with significant borderline features, the UP resulted in symptom improvement that was moderate in magnitude. Additionally, those who received a longer course of care (12 vs. 6 sessions) demonstrated moderately lower BPD scores. Given our small sample, we elected to focus on effect size rather than statistical significance (confidence intervals for these analyses included zero suggesting these effects were not significant) and future research should attempt to replicate these findings in a larger sample.

One possible explanation for the disparity between the present study's findings and previous research on applying the UP in BPD samples is that prior work (e.g., Lopez at al., 2015; Sauer-Zavala et al., 2016) specifically recruited participants with BPD diagnoses. Given that these studies were explicitly designed to test the effect of the UP for BPD, it is likely that therapists were more compelled to specifically apply UP skills to BPD symptoms. Indeed, in Lopez et al. (2015) study, "the UP specifically targeted borderline symptomatology." On the other hand, the present study recruited participants based on anxiety or depressive disorders; BPD symptoms were not assessed on clinician-rated instruments, so study therapists were likely unaware that some of their patients had comorbid BPD. In other words, despite BPD symptoms being functionally related to the targets of the UP, therapists might not have asked about/targeted them in treatment. Perhaps, for the UP to replicate efficacy with BPD from the abovementioned studies, the clinicians need to make a point to use UP skills specifically for BPD symptoms.

Additionally, the length of the treatment in this study was shorter compared to other brief interventions. It is possible that the treatment length was simply not sufficient for reductions in BPD symptoms. In the current study, participants underwent 6 (Brief) or 12 (Full) weeks of treatment. The treatment in the extant studies, mentioned in the introduction, focusing specifically on the efficacy of the UP with BPD, lasted between 14 and 29 weekly sessions (Lopez et al., 2015; Sauer-Zavala et al., 2016; Tonarely et al., 2020). Furthermore, a recent meta-analysis reviewing randomized controlled trials (RCTs) of brief BPD interventions (Spong et al., 2021) revealed that although brief interventions may be effective, no direct conclusions can be made about the long-term impact of those interventions. Notably, all RCTs reviewed in this meta-analysis were between three and six months long, suggesting that short-term BPD treatments might be useful, but there is a minimum timeframe required for the length of an effective treatment. One study of patients with BPD noted significant reductions in depression, impulsivity, self-esteem, emotion regulation, self-harm, and suicidality after only 12 weeks of group and individual therapy that integrated components of dialectical behavior therapy, mentalization-based therapy, and other structured treatments (Laporte et al., 2018). However, their outcomes did not include BPD symptom severity. Lastly, there is a dearth in the literature about BPD treatments as short as 12 sessions and as such, we cannot conclude whether 12 weekly sessions were enough to produce significant results in reductions of BPD symptoms.

Given that the UP purports to target negative emotionality, we anticipated larger reductions in the emotional problems subscale of the PAI-BOR relative to the other subscales. Our second hypothesis was not supported such that, although minimal, a larger degree of change was observed for identity problems and impulsivity relative to emotional difficulties between baseline and assessments 2 and 3. It is possible that emotional problems measured by the subscale of affective instability, such as *sudden* mood changes (which can be negative), might not be well represented by neuroticism targeted by the UP. Also, given that there were no statistically significant improvements in BPD symptoms in this sample overall or in the BPD subsample, the effect of the UP on emotional problems could have been diluted. Lastly, the confidence intervals of the computed effect sizes in all subscales were similar in ranges, and thus we cannot draw sound conclusions about which subscale improved the most.

Next, we sought to explore whether FFM traits at baseline were associated with treatment response to the UP. Extant personality disorder research suggests that BPD can be understood as elevations in neuroticism, along with low levels of agreeableness and conscientiousness (e.g., Mullins-Sweatt et al., 2012). Given that the UP was developed to address neuroticism, we hypothesized that individuals endorsing low levels of agreeableness and/or conscientiousness would not respond as well to this intervention. For patients classified as exhibiting high neuroticism (and at least moderate levels of agreeableness and conscientiousness), three out of six participants (50%) demonstrated reductions in BPD symptoms from baseline to assessment 2, and these improvements continued to grow by assessment 3 (of note, only two of these participants was in the Full Treatment condition). Although almost all participants with high neuroticism and low conscientiousness experienced

reductions of BPD symptoms from baseline to assessment 2, only one of these participants (20%) continued experiencing reduction in BPD symptoms by assessment 3. In contrast, four out of six participants (67%) with high levels of neuroticism and low levels of conscientiousness exhibited worsening symptoms from assessment 2 to assessment 3. Thus, our hypothesis regarding within-person change in BPD scores based on patients' FFM profiles was partially supported. Individuals with FFM profiles characterized by low conscientiousness may exhibit early gains in the UP treatment but are unable to sustain them across a longer period of time, suggesting the need to engage this trait in a comprehensive treatment for BPD. Additionally, as we already mentioned, the duration of the treatment (i.e., 6 or 12 sessions) might have simply not sufficed to treat BPD symptoms effectively.

While this study conveys important information about the utility of the UP in the treatment of borderline symptoms, there are several important limitations that need to be addressed. The number of participants who presented significant borderline features in the parent study was small, as the parent study's inclusion criteria did not include BPD diagnosis, and thus our analyses were not powered to detect change. However, despite the limited number of participants exhibiting BPD traits, our study detected a potentially important signal pertaining to personality differences among individuals with BPD during the treatment of UP. It is also important to note that the BPD disorder was not assessed by the Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II; First & Gibbon, 2004) which would yield an accurate diagnosis. Instead, a total score of 38 or higher (equivalent to 70T) on the self-reported Personality Assessment Inventory-Borderline Features Subscale (PAI-BOR; Morey, 1991) was used to identify participants who presented significant borderline features. Although score of $\geq$ 70T may indicate potential BPD diagnosis if there are substantial elevations on all subscales, it might have not been as accurate as a structured clinical assessment. Furthermore, participants in this study were exposed to different sequencing arrangements of UP modules, and some individuals received a greater number of modules than others. Consequently, the generalization of these findings to the conventional administration of the UP may be limited. Nevertheless, it is worth highlighting that there were no significant disparities in the trajectories of improvement across different sequencing conditions, nor were there any significant distinctions between the outcomes of brief personalized treatment and the full standard treatment, as observed in the overarching parent study (Sauer-Zavala et al., 2022). Further, our findings may not be generalizable to individuals not seeking treatment for anxiety, depressive, and related disorders.

Despite the limitations in this study, this manuscript is an important step in defining the utility of the Unified Protocol with patients who display significant borderline features, specifically, when comorbid with anxiety, depressive, and related disorders. In sum, individuals with significant borderline features experienced small to moderate, yet not statistically significant, improvements in their borderline symptoms. However, the participants with significant borderline features who mapped onto the typical FFM profile of BPD did not sustain these improvements in the long term. As such, the UP may be helpful in treating comorbid BPD symptoms in the short term, but to achieve large and sustained improvements, clinicians ought to focus on the BPD symptomology as a primary target and prioritize agreeableness and conscientiousness traits as well.

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