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THE UTILITY OF THE UNIFIED PROTOCOL IN TREATING BORDERLINE PERSONALITY DISORDER

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THE UTILITY OF THE UNIFIED PROTOCOL IN TREATING BORDERLINE PERSONALITY DISORDER

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
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By

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ABSTRACT OF THESIS

THE UTILITY OF THE UNIFIED PROTOCOL IN TREATING BORDERLINE PERSONALITY DISORDER

Borderline personality disorder (BPD) is characterized by maladaptive levels across three personality domains: Neuroticism, (low) Agreeableness, and (low) Conscientiousness. The Unified Protocol (UP) is a transdiagnostic treatment that targets neuroticism and has demonstrated promising effects with BPD. However, not all individuals with BPD respond to UP treatment. The aim of the current study was to explore the extent to which the UP is an efficacious treatment for BPD symptoms. This study represents a secondary analysis of a clinical trial in which the UP was the study treatment; data from the full sample and a subset of nine participants who likely met criteria for BPD were included. First, we explored within-group changes in general BPD symptoms, along with specific symptom domains. Improvements in total BPD symptoms were not observed in the full sample, whereas the UP resulted in moderate overall BPD symptom improvement among participants with BPD. Contrary to expectations, emotional difficulties did not exhibit larger effects than other domains. We also explored differences in within-person change in BPD scores during treatment based on patients' FFM profiles at baseline. Change on BPD symptoms was not predicted by a typical BPD FFM profile. Possible explanations for the results and limitations were discussed.

KEYWORDS: borderline personality disorder, Unified Protocol

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CHAPTER 1. INTRODUCTION

1.1 Background

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 targets the emotional disorder functional model (Bullis et al., 2019) in which (1) frequently occurring negative emotions (neuroticism) are (2) met with aversive reactions that, in turn, lead to (3) efforts to avoid or suppress emotional experiences. Aversive/avoidant reactions to emotions paradoxically increase the frequency and intensity of negative emotional experiences (Aldao & Nolen-Hoeksema, 2010; Cisler & Olatunji, 2012; Ottenbreit et al., 2014), thereby maintaining the neurotic temperament (e.g., Sauer-Zavala et al., 2020). Thus, the UP consists of several core treatment modules broadly aimed at extinguishing distress in response to strong emotions (Payne et al., 2014). By targeting aversive reactions 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 (Clarkin et al., 1993; 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 avoidance from unwanted negative emotions (Aldao & Nolen-Hoeksema, 2010; Baker et al., 2004; 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 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 in their symptoms. 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. To meet the BPD diagnosis, an individual must endorse five out of nine diagnostic criteria (American Psychiatric Association [APA], 2013). As such, there are two hundred fifty-six possible combinations of criteria that might render the same diagnosis and two individuals with the same diagnosis of BPD might share only one diagnostic criterion (APA, 2013; Smits et al., 2017). Additionally, several studies

identified specific subtypes of BPD based on DSM criteria (e.g., Hallquist & Pilkonis, 2012; Smits et al., 2017). This heterogeneity may be due to the fact that several psychopathological mechanisms, beyond neuroticism/emotional dysfunction, have been proposed to account for the development of BPD (e.g., insecure attachment, impulsivity); if treatments are not engaging the maintaining factors relevant for an individual patient with BPD, they may be less likely to respond. In addition to emotional vulnerability described by Linehan (1993), two other constructs thought to be implicated in the etiology of BPD are discussed below.

Some theorists contend that insecure attachment processes play a key role in the development and maintenance of BPD (Agrawal et al., 2004; Choi-Kain et al., 2009; Fonagy et al., 2000, 2003; Sack et al., 1996). The theory of insecure attachment in BPD stipulates that the absence of secure caregiver bonds in childhood lies at the core of BPD and has lifetime consequences such that adult individuals with BPD do not have the confidence in the availability of attachment figures (e.g., friends, romantic partners), especially when support, protection, and comfort is sought and needed (Fonagy et al., 2003; Levy, 2005). As a result, individuals with BPD exhibit an intense need for closeness and dependency as well as intense fears of rejection or abandonment. And even though these individuals find close relationships important, they are acutely sensitive to subtle events in their social environment that frequently lead to volatile relationships, isolative behaviors, emotion intensity, and impulsivity (Scott & Pilkonis, 2018).

Additionally, several studies have implicated trait impulsivity, or the tendency to act without careful thought, reflection, or regard for the negative and long-term consequences (Vandenbos, 2007), as an important risk mechanism for the

development and maintenance of BPD (Bornovalova et al., 2005; Crowell et al., 2009; Lieb et al., 2004; Links et al., 1999; Terzi et al., 2017; Turner et al., 2017). Like the neurotic temperament, the tendency to behave impulsively is biologically-based (Coccaro et al., 1993), and may be exacerbated during heightened emotional states (Linehan, 1993; Stanley & Singh, 2018). In other words, when faced with intense and uncontrollable negative affect, individuals with BPD who are high in impulsivity may engage in extreme maladaptive behaviors, such as binge-eating, substance use, gambling, and unsafe sexual activities (Jacob et al., 2013; Lieb et al., 2004), along with nonsuicidal self-injurious behaviors and suicide attempts (Linehan, 1993; Siever, 2018). In this way, impulsive behaviors serve as means to regulate extreme negative emotions which, in turn, perpetuate the rise of negative emotions (Stanley & Singh, 2018). Thus, for some individuals with high levels of trait impulsivity, addressing negative affect alone (i.e., without targeting impulsive behaviors implicated in negative emotion regulation) may not significantly reduce BPD behavioral dysfunction.

It is important to note that these proposed 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 (vs. introversion), neuroticism, the frequent and intense experience of negative emotions (vs. emotional stability), openness to experience, or the willingness to try new activities (vs. closeness to experience), agreeableness, or the quality of being friendly and cooperative (vs. antagonism), and conscientiousness, or the ability to evaluate

consequences of one's behavior (vs. impulsivity). 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, in the alternative model of personality disorders in Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5; APA, 2013), BPD is characterized 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 dimensional 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.

1.2 Current Study

The main aim of the current study was to gather preliminary evidence to investigate the extent to which the UP is a helpful treatment for BPD using secondary data drawn from a sequential multiple assignment randomized trial (SMART; Sauer-Zavala et

al., under review). Given previous pilot work exploring the UP's effect on BPD symptoms (reviewed above), we hypothesized that this intervention would result in significant BPD symptom improvement among participants who likely met criteria for this condition. Additionally, we sought to examine whether specific BPD domains would improve across a course of care with the UP among participants who likely met criteria for BPD. 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 BPD 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.

CHAPTER 2. METHOD

2.1 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 having at least one of the following DSM-5 (APA, 2013) diagnoses: panic disorder (PD), generalized anxiety disorder (GAD), social anxiety disorder (SAD), obsessive-compulsive disorder (OCD), posttraumatic stress disorder (PTSD), major depressive disorder (MDD), or persistent depressive disorder (PDD). 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 the study participation (i.e., from the time they consented to the study).

The parent trial included 57 participants and a subset of participants (n = 9, 15.8%), who likely met criteria for borderline personality disorder (i.e., individuals with pre-treatment Personality Assessment Inventory-Borderline Features Subscale [PAI-BOR;

Morey, 1991] total scores ≥ 38 [equivalent to 65T]), and provided data at all timepoints in order to a) calculate within-person scores and b) directly compare within-person change scores in the same sample between first and second assessments, first and third assessments, and second and third assessments. The nine participants' mean age was 29.22 (SD = 8.44, range: 20-47), they were mostly female (66.7%) and Caucasian (77.8%). All participants finished high school and 66.7% of them had completed an undergraduate degree or higher. A little over a half of participants were single and never married (55.6%) and approximately two thirds considered themselves straight or heterosexual (66.7%). The remaining participants from the parent study (n = 48) were 35.06 old on average (SD = 12.70, range 19-63), mostly female (66.7%) and Caucasian (77.1%). Everyone in the non-BPD sample completed high school or GED and 66.6% completed an undergraduate degree or higher. 37.5% of the participants were married and one third were single or never married (33.3%). Most of this sample (77.1%) considered themselves straight or heterosexual. Participant characteristics in both groups were compared via independent samples t tests for continuous variables, and c2 tests of independence for nominal and categorical variables, but no differences were found.

2.2 Measures

2.2.1 DSM-5 Diagnoses

The Diagnostic Interview for Anxiety, Mood, and Obsessive-Compulsive and Related Neuropsychiatric Disorders (DIAMOND; 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). The

DIAMOND has demonstrated very good (κ = .62) to excellent (κ = 1.00) interrater reliability and good (κ = .59) to excellent (κ = 1.00) test-retest reliability on both presence/absence of the diagnosis and severity rating; convergent validity was verified by significant between-group comparisons on applicable self-report measures for nearly all diagnoses (Tolin et al., 2018). Trained graduate students, who administered the DIAMOND, demonstrated excellent reliability on categorical ratings of primary diagnoses (Krippendorff's αs: .91-1.00; median = 1.00) and CSRs of each disorder (Krippendorff's αs: .83-1.00; median = .92).

2.2.2 BPD Symptoms

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). Both the construct and discriminant validity were established via objective life-event data correlations (Slavin-Mulford et al., 2012). Concurrent validity was also established, supporting the utility of PAI-BOR in assessing for BPD diagnosis (Stein et al., 2007). The internal consistency of PAI-BOR items in the parent study at baseline was acceptable (McDonald's ω = .64).

2.2.3 FFM Domains

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 consistencies reported for all domains were good, ranging from .75 to .83 (Costa & McCrae, 1992). The internal consistency of NEO-FFI items on the neuroticism subscale in the parent study at baseline was good (McDonald's ω = .82). Internal consistency of NEO-FFI items in the parent study at baseline on the extraversion subscale was good (McDonald's ω = .84), on the agreeableness subscale was acceptable (McDonald's ω = .60), on the conscientiousness subscale was excellent (McDonald's ω = .90), on the openness subscale was acceptable (McDonald's ω = .62).

2.3 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 participants were paid $25 for their time at the second and third assessment 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).

2.4 Analytic Approach

2.4.1 Characterizing Change in BPD Symptoms During Treatment with the UP

In the case of missing data[1], listwise deletion was utilized to ensure data at all timepoints in order to calculate within-person change scores across timepoints. 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., under review). 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 the subscales Hedges's g was calculated in both the full sample and the BPD subset. 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[2]. The Hedges's g is a preferable approach for analyses of treatment studies because it gives an unbiased estimate

[1] Multiple imputation approach did not yield differences in the results and thus raw data were used for analyses as a more conservative approach.

[2] 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.

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 all study timepoints, 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.

2.4.2 FFM Dimensions as Predictors of BPD Symptom Improvement

To explore whether FFM dimensions predict improvements BPD symptoms, we conducted a set of hierarchical regression analyses in the full sample. Specifically, we regressed BPD symptoms at assessment 2 (i.e., after 5 weeks of treatment) on to baseline BPD symptoms and either neuroticism, agreeableness, or conscientiousness; three separate regressions were conducted so that each FFM dimension was included in its own model. We elected to examine BPD symptoms as assessment 2 in order to increase our power to detect an effect given that all participants received treatment from baseline to assessment 2.

Given that BPD symptoms were relatively low in the full sample (perhaps creating a floor effect for improvements), along with the fact that there were only 9 individuals in our BPD subset, we conducted exploratory analyses to investigate whether FFM profiles were related to within-individual change on BPD symptoms. 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). The Sdiff was calculated as a square root of 2*(SE)2 in which the standard error (SE) was computed as SD*sqrt (1 – rxx). Standard deviation (SD = 13.85) and a reliability coefficient (rxx = 0.91) were taken from normative data using the clinical sample in the PAI Professional Manual 2nd Edition (Morey, 1991). Sdiff 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. Next, to examine whether FFM profiles affect the extent to which individual participants respond to the UP, we graphically represented each patient's FFM scores at baseline. Participants were categorized into two groups: 1) high neuroticism (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.

2.5 Power

Given that this study is a secondary data analysis, a sensitivity analysis to determine the strength of the effect that can be reliably detected was conducted (Faul et al., 2007). Specifically, we conducted a sensitivity analysis regarding the hypotheses regarding the effect of UP treatment on the total BPD score and the subscales. Based on a sensitivity power analysis in G*Power Version 3.1 (Faul et al., 2009) assuming $\alpha = .05$ (two-tailed), power = 0.80, total sample size = 9, the minimum effect size that could

reliably yield a statistically significant result given this study's sample size was d = 1.07. Given the descriptive and exploratory nature of the third aim, investigating whether there are differences in within-person change in BPD scores during treatment based on different FFM profiles at baseline, power and sensitivity analyses were inappropriate and thus not conducted.

CHAPTER 3. RESULTS

3.1 Characterizing Change in BPD Symptoms During Treatment with the UP

Means and standard deviations for the PAI-BOR and each of its subscales can be viewed in Table 1 for both the full sample and the BPD sample. Change was in the expected direction from baseline to Assessment 2 (i.e., following 5 sessions of UP treatment) in all but one instance (i.e., the full sample demonstrated a slight increase on the Emotional Problems subscale). In general, any improvements were largely maintained at Assessment 3 (i.e., after 12 sessions for individuals in the Full Treatment condition, after a 6-week follow-up period for individuals in the Brief Treatment condition). Hedges's g was used to evaluate the magnitude of change on each variable; detailed information concerning within-participants effect sizes between assessments are reported in Table 1. In the full sample, the degree of change was minimal across all assessment points. However, in the BPD subsample, the UP was associated with moderate reductions in total BPD symptoms between assessments 1 and 2 and between assessments 1 and 3, along with small reductions in the PAI-BOR subscales at these timepoints. Of note, the confidence intervals for these effect size estimates included zero, suggesting that these within-group improvements were not statistically significant (likely due to our small sample size).

Additionally, Hedges's g was also calculated to determine the degree of difference on BPD symptoms between the Full and Brief Treatment conditions at all time points. The results are reported in Table 2. 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 with BPD in the Full Treatment

condition reported significantly lower symptoms of emotional problems than those in the Brief Treatment condition at assessment 1; however, by assessment 2, these differences were no longer significant. Similarly, patients with BPD in the Full Treatment condition reported significantly lower symptoms of identity problems at assessment 2 relative to patients in the Brief Treatment condition. With regard to our comparison of substantive interest, comparing BPD symptoms at assessment 3 for patients who completed a full 12 session and patients who completed 6 sessions and a 6-week follow-up period, there were no significant differences between groups. In the full sample, differences between individuals in the Full Treatment condition and Brief treatment condition on overall BPD symptoms, emotional problems, and relationship problems were small in magnitude, favoring patients who received all 12 sessions. A similar pattern of results was demonstrated for the BPD subset, yet differences between treatment length conditions were moderate in magnitude for overall BPD symptoms, emotional problems, and relationship problems, along with large differences for identity problems. Again, confidence intervals for these effects included zero, indicating that they are not statistically significant (again, likely due to small sample size).

3.2 FFM Dimensions as Moderators of BPD Symptom Improvement

Separate hierarchical multiple regression models were used to assess whether FFM dimensions predict total BPD score at assessment 2 for the full sample, after controlling for baseline total BPD scores (see Table 3). Baseline total BPD scores were entered at Step 1 for each model, explaining 63.2% of the variance in total BPD scores at assessment 2. In Step 2 of each model, agreeableness and conscientiousness were not

significant predictors of the total BPD scores at assessment 2, whereas neuroticism was marginally significant.

For our exploratory analyses investigating whether FFM profiles were related to within-individual change on BPD symptoms, we first graphically represented each patient's BPD-relevant FFM scores (neuroticism, agreeableness, conscientiousness) at baseline (see Figure 1). Using normative data from the NEO-FFI-3 professional manual, all patients in the BPD subsample were categorized as exhibiting high neuroticism scores, whereas five 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 4; shaded rows represent individuals classified as exhibiting high neuroticism and low conscientiousness, whereas non-shaded rows represent those that endorsed high neuroticism, only. Across all 9 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 5). Participant 3, who was in Full Treatment condition, reported fourteen-points reduction 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 9, from Brief Treatment condition, reported significant decrease in their total BPD scores at assessment 3. Overall, there were no discernable patterns in rates of improvement as a function of baseline FFM scores.

Table 1: Within Participant Effect Sizes for change in BPD Symptoms in the Full and BPD Subset Samples

	Full Sample (N = 59)											
	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	29.16	9.66	29.09	10.41	0.01	[-0.16, 1.80]	28.82	10.91	0.02	[-0.17, 0.21]	0.06	[-0.08, 0.20]
Subscales												
Emotional Problems	7.75	3.08	8.11	3.58	-0.11	[-0.31, 0.10]	7.91	3.25	-0.06	[-0.27, 0.15]	0.06	[-0.11, 0.23]
Relationship Problems	8.18	3.62	7.86	3.47	0.09	[-0.09, 0.27]	8.23	3.97	-0.05	[-0.25, 0.16]	-0.08	[-0.24, 0.09]
Identity Problems	9.09	3.05	9.00	3.88	0.02	[-0.17, 0.21]	8.49	3.84	0.18	[-0.05, 0.38]	0.02	[0.01, 0.39]
Impulsivity	4.14	3.23	4.13	3.12	0.01	[-0.16, 0.17]	4.19	3.30	-0.01	[-0.14, 0.13]	-0.01	[-0.16, 0.15]

Table 1 (Continued)

	BPD Subset (n = 9)											
	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	45.89	4.23	41.78	7.55	0.61	[-0.24, 1.45]	41.22	9.67	0.54	[-0.30, 1.39]	0.06	[-0.57, 0.69]
Subscales												
Emotional Problems	12.00	2.40	11.44	3.57	0.16	[-0.41, 0.73]	11.11	3.66	0.26	[-0.48, 1.00]	0.09	[-0.44, 0.62]
Relationship Problems	12.67	3.24	11.44	3.50	0.34	[-0.33, 1.02]	11.67	3.54	0.28	[-0.62, 1.19]	-0.06	[-0.66, 0.54]
Identity Problems	13.00	2.35	12.00	3.97	0.27	[-0.40, 0.94]	11.44	4.48	0.37	[-0.32, 1.06]	0.12	[-0.27, 0.52]
Impulsivity	8.22	3.90	6.89	3.86	0.33	[-0.03, 0.68]	7.00	4.42	0.26	[0.00, 0.52]	0.03	[-0.44, 0.39]

Table 2: Between Condition Effect Sizes for BPD Symptoms as a Function of Treatment Length

Full Sample

	BL				A2				A3			
	Brief M (SD)	Full M (SD)	Hedges' g	95% CI UL, LL	Brief M (SD)	Full M (SD)	Hedges' g	95% CI UL, LL	Brief M (SD)	Full M (SD)	Hedges' g	95% CI UL, LL
BPD Symptoms	29.91 (9.92)	28.65 (9.03)	-0.13	[-0.60, 0.34]	30.00 (11.40)	28.48 (9.35)	0.14	[-0.37, 0.66]	30.31 (11.81)	27.00 (9.82)	0.30	[-0.21, 0.81]
Emotional Problems	8.09 (3.54)	7.53 (2.54)	0.18	[-0.30, 0.66]	8.40 (3.94)	7.85 (3.11)	0.15	[-0.36, 0.66]	8.45 (3.72)	7.34 (2.58)	0.34	[-0.17, 0.85]
Relationship Problems	8.65 (3.63)	7.74 (3.56)	0.25	[-0.22, 0.72]	8.37 (3.93)	7.41 (2.83)	0.27	[-0.24, 0.79]	9.14 (4.50)	7.17 (3.14)	0.50	[-0.02, 1.01]
Identity Problems	9.47 (3.21)	8.79 (2.97)	0.22	[-0.26, 0.69]	9.47 (4.09)	8.59 (3.61)	0.22	[-0.29, 0.74]	8.76 (4.15)	8.10 (3.53)	0.17	[-0.34, 0.68]
Impulsivity	3.71 (2.92)	4.59 (3.70)	-0.26	[-0.73, 0.21]	3.77 (2.90)	4.63 (3.34)	-0.27	[-0.79, 0.24]	3.97 (3.42)	4.38 (3.17)	-0.12	[-0.63, 0.39]

Table 2 (Continued)

	BPD Subset											
BPD Symptoms	46.80 (4.76)	44.75 (3.77)	0.42	[-0.88, 1.79]	46.00 (5.700)	36.50 (6.45)	1.40	[-0.01, 2.73]	44.60 (9.40)	37.00 (9.42)	0.72	[-0.53, 1.92]
Emotional Problems	13.40 (1.95)	10.25 (1.71)	1.51	[0.07, 2.88]	12.80 (3.56)	9.75 (3.20)	0.79	[-0.47, 2.01]	12.20 (4.60)	9.75 (1.71)	0.60	[-0.63, 1.78]
Relationship Problems	12.80 (3.70)	12.50 (3.11)	0.08	[-1.09, 1.24]	12.80 (3.96)	9.75 (2.22)	0.81	[-0.45, 2.03]	12.60 (4.16)	10.50 (2.65)	0.52	[-0.70, 1.70]
Identity Problems	13.60 (1.52)	12.25 (3.20)	0.50	[-0.71, 1.68]	14.60 (2.07)	8.75 (3.30)	1.95	[0.37, 3.44]	13.80 (3.63)	8.50 (3.87)	1.26	[-0.11, 2.56]
Impulsivity	7.00 (3.94)	9.75 (3.77)	-0.63	[-1.82, 0.60]	5.80 (3.70)	8.25 (4.11)	-0.56	[-1.75, 0.66]	6.00 (5.15)	8.25 (3.59)	-0.44	[-1.61, 0.77]

Table 3: Baseline FFM Domains as Predictors of BPD Symptom Change in the Full Sample

	B	SE	ß	p
Neuroticism	0.26	0.13	0.18	0.053
Agreeableness	-0.20	0.18	-0.10	0.270
Conscientiousness	0.08	0.10	0.07	0.428

Note: Dependent variable is BPD symptoms at A2. In addition to the FFM domain (entered at step 2), BPD symptoms at baseline is entered at step 1 as a predictor in each regression model

Table 4: Within-Individual Change in BPD Symptoms for the BPD Subsample

	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, .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, .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	53.00	54.00	11.00 (-.52, 22.52)	12.00* (.48, 23.52)
Patient 6	44.00	40.00	45.00	-4.00 (-15.52, 7.52)	1.00 (-10.52, 12.52)
Patient 7	49.00	42.00	49.00	-7.00 (-18.52, 4.52)	0.00 (-11.52, 11.52)
Patient 8	54.00	51.00	46.00	-3.00 (-14.52, 8.52)	-8.00 (-19.52, 3.52)
Patient 9	45.00	44.00	29.00	-1.00 (-12.52, 10.52)	-16.00* (-27.52, -4.48)

Note. †Patient was in full treatment condition. *Denotes significant change score. Participants with high neuroticism and low conscientiousness are displayed in shaded rows. 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.

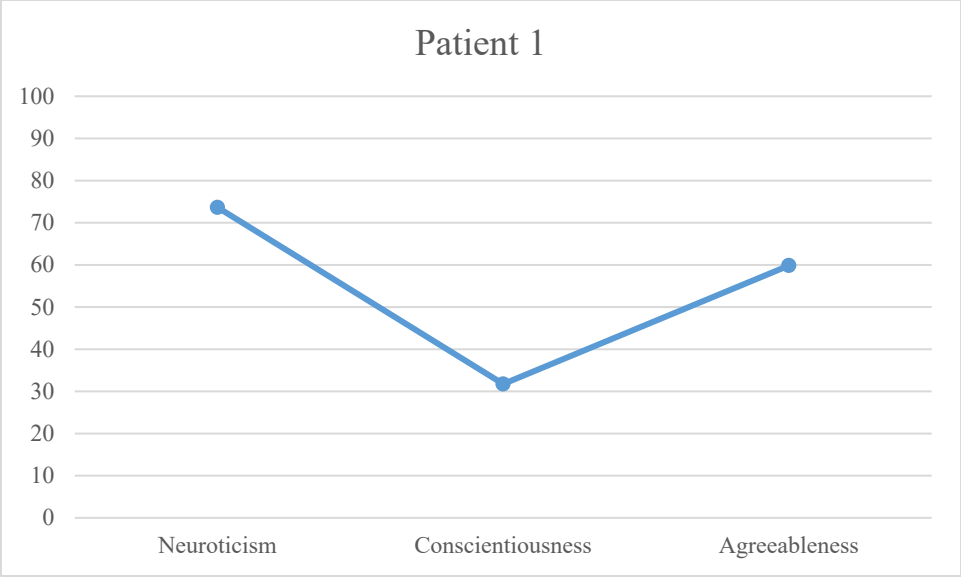

Figure 1: Baseline FFM profile of Patient 1

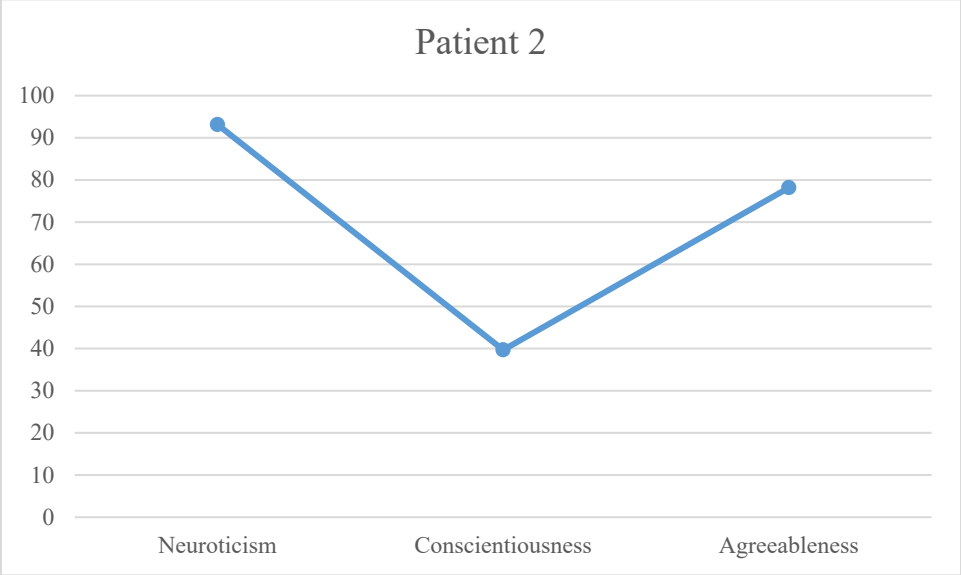

Figure 2: Baseline FFM profile of Patient 2

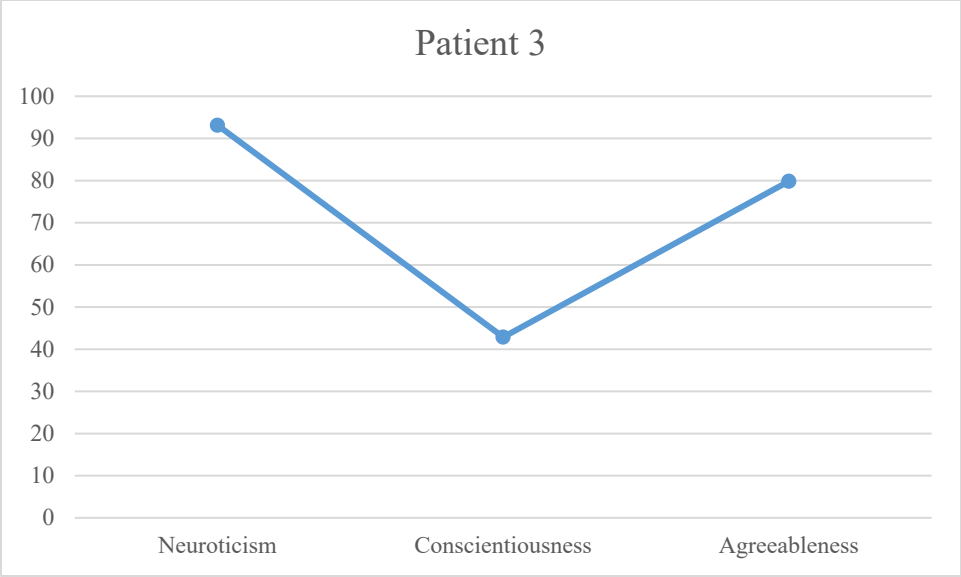

Figure 3: Baseline FFM profile of Patient 3

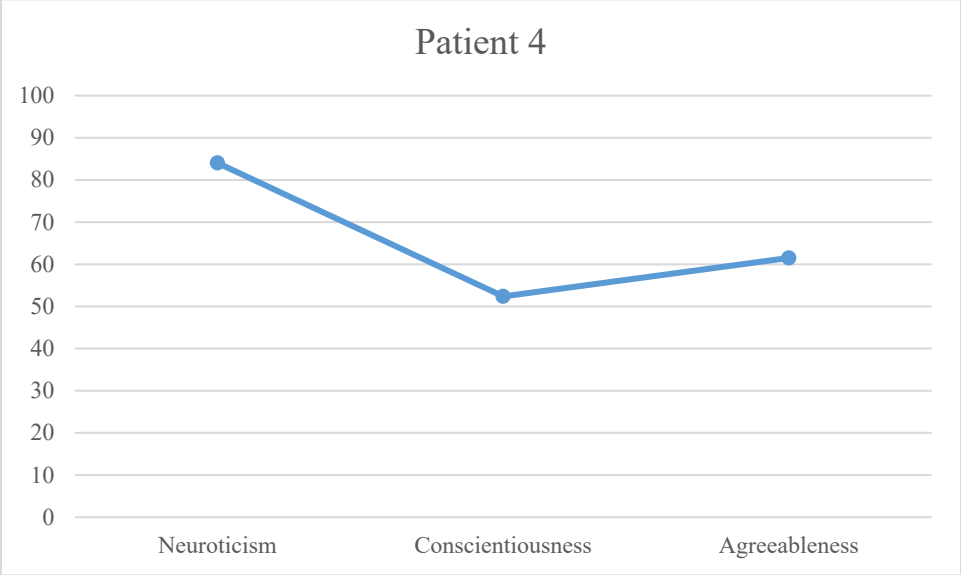

Figure 4: Baseline FFM profile of Patient 4

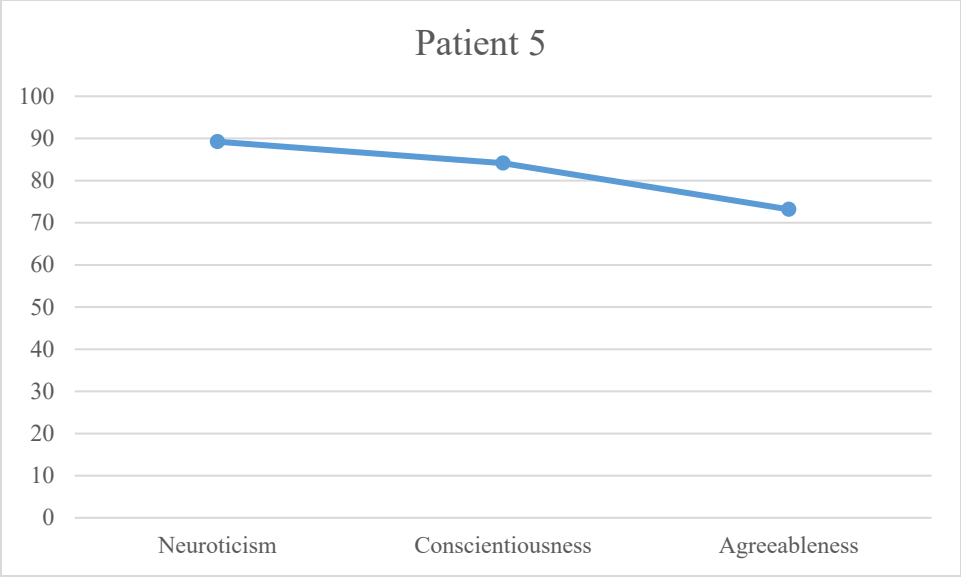

Figure 5: Baseline FFM profile of Patient 5

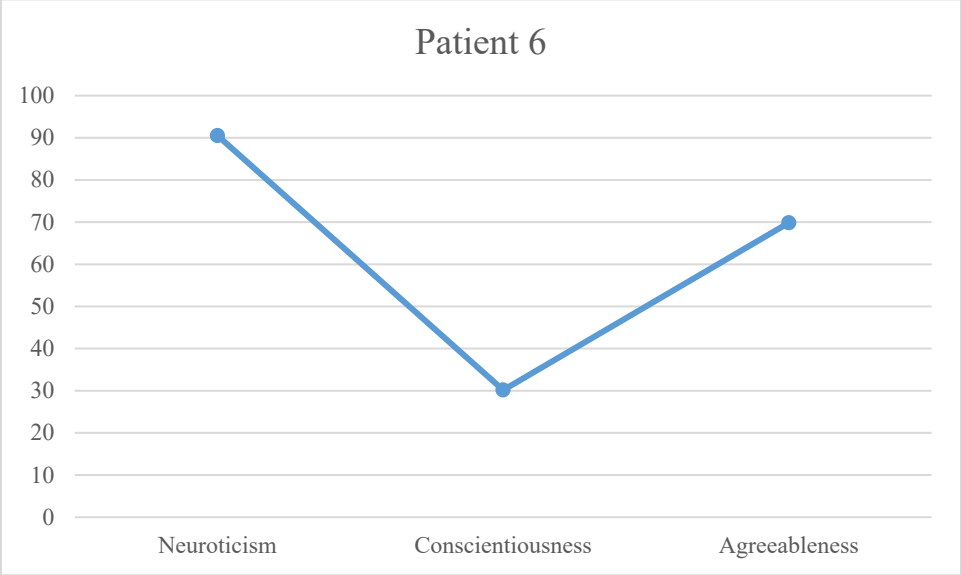

Figure 6: Baseline FFM profile of Patient 6

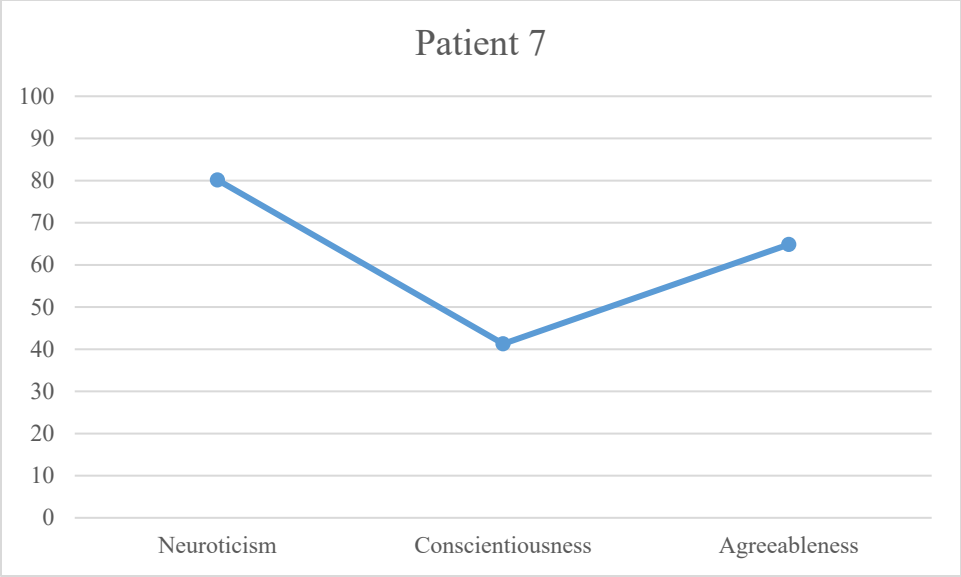

Figure 7: Baseline FFM profile of Patient 7

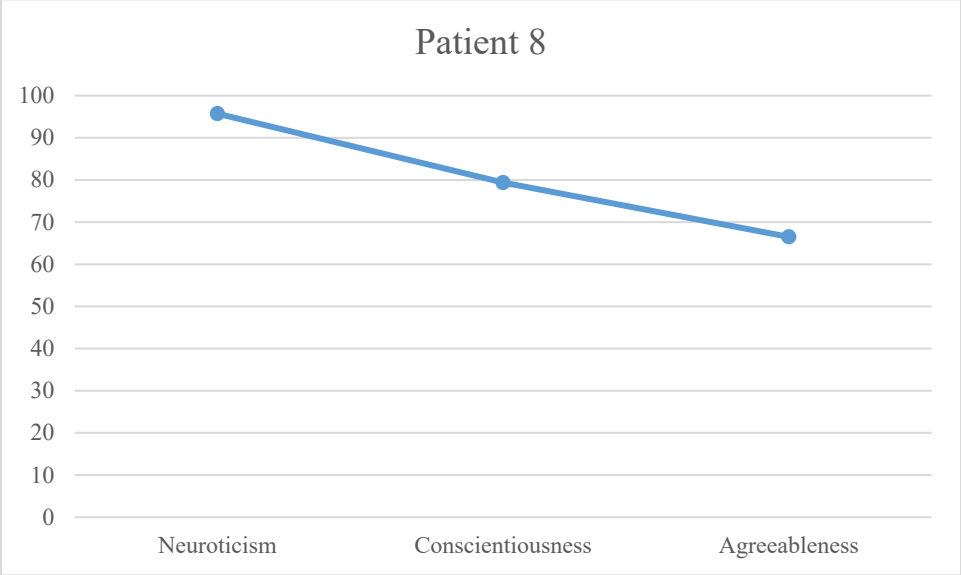

Figure 8: Baseline FFM profile of Patient 8

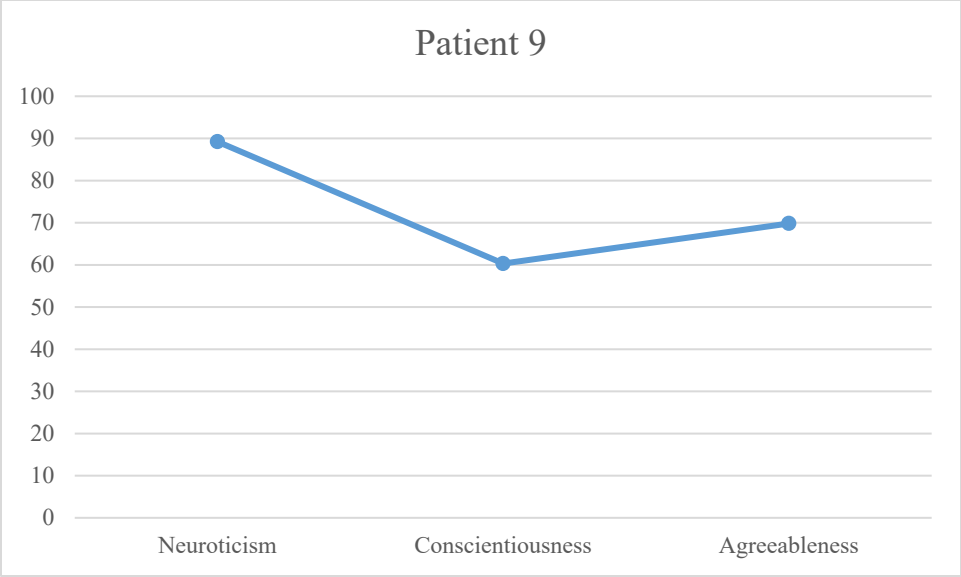

Figure 9: Baseline FFM profile of Patient 9

CHAPTER 4. DISCUSSION

The purpose of the present study was to explore the utility of the Unified Protocol (UP) with treatment of borderline personality disorder (BPD) and whether there are factors that may affect BPD symptom improvements during treatment. Patients with principal 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 (9 individuals) likely met criteria for comorbid BPD. 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 as well. Contrary to expectations, improvements in total BPD symptoms were not observed in the full sample, likely due to floor effects (scores on the PAI-BOR were quite low in our sample, overall). However, among participants who likely met criteria for this condition, our first hypothesis was partially supported such that the UP resulted in moderate overall BPD symptom improvement, though these changes were not statistically significant.

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 session (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 treatment. There was one study of patients with BPD in which significant reductions in depression, impulsivity, self-esteem, emotion regulation, self-harm, and suicidality were noted only after 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 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, relationship 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 somewhat 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. Using the full sample to increase our power, regression analyses suggested that change on BPD symptoms from baseline to assessment 2 (i.e., following five sessions of the UP) was

not predicted by baseline levels of agreeableness, or conscientiousness – contrary to expectations. Neuroticism demonstrated a trend towards significance ($p = .053$), suggesting that higher baseline levels of this trait are associated with less improvement in BPD symptoms. This finding appears to be consistent with a body of research documenting that higher levels of neuroticism predict poorer outcomes in depressive disorders (e.g., Bock et al., 2010; Hayden & Klein, 2001; Quilty et al., 2008). It is possible then that the already high levels of neuroticism in the current sample precluded improvements in BPD symptoms.

Given that the full sample did not endorse a high degree of BPD symptoms, we sought to explore whether baseline personality profiles of patients in our BPD subset could be used to predict treatment response. For patients classified as exhibiting high neuroticism (and at least moderate levels of agreeableness and conscientiousness), three out of four participants (75%) demonstrated reductions in BPD symptoms from baseline to assessment 2, and these improvements continued to grow by assessment 3 (of note, only one of these participants was in the Full Treatment condition). Although all five 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 five participants (80%) 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 treatment but are unable to sustain them

across a longer period of time, suggesting the need to engage in 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 treatment of BPD, there are several important limitations that need to be addressed. Given that this was a secondary analysis project with a relatively small sample size, we were underpowered for regression analyses as well as unlikely to detect significant effects in magnitudes of change. Additionally, the number of participants who likely met criteria for BPD was also small, as the parent study's inclusion criteria did not include BPD diagnosis, and thus our analyses were not powered to detect change. 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 accurate diagnosis. Instead, a total score of 38 or higher (equivalent to 65T) on the self-reported Personality Assessment Inventory-Borderline Features Subscale (PAI-BOR; Morey, 1991) was used to identify participants who would likely meet the criteria for BPD diagnosis. Although this instrument has been reasonably reliable in identifying individuals with BPD, it might have not been as accurate as a structured clinical assessment. 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 with BPD. Specifically, when comorbid with anxiety, depressive, and related disorders. In sum, individuals with BPD

experienced small to moderate, yet not statistically significant, improvements in their symptoms. However, the participants with BPD 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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King County Visitation Supervisor January 2011 – January 2012
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Research Supplements to Promote Diversity in Health-Related Research
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National Institute of Mental Health (NIMH)

UK McNair Fellowship August 2020 – April 2021
Ronald E. McNair Post-Baccalaureate Achievement Program
University of Kentucky Graduate School

Staff Scholarship Award February 2019
University of Washington

Best APA Student Poster August 2018
Poster Title: *Perceived burdensomeness, bullying, and suicidal ideation in suicidal military personnel*
APA Science at Sunset Poster Competition
APA Convention 2018, American Psychological Association

Staff Scholarship Award February 2018
University of Washington

Mary Gates Research Scholarship March 2016
Mary Gates Endowment for Students
University of Washington

Psychology Undergraduate Honors Research Development Award January 2016
Department of Psychology
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Undergraduate Research Stipend January 2016

Ronald E. McNair Post-Baccalaureate Achievement Program
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McNair Scholar June 2015
Ronald E. McNair Post-Baccalaureate Achievement Program
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Dean's List September 2014 – June 2015
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Osher Reentry Scholarship September 2014
The Bernard Osher Foundation
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Phi Theta Kappa Honor Society November 2012
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PUBLICATIONS

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Fruhbauerova, M., & Comtois, K. A. (2019). Addiction counselors and suicide: Education and experience do not improve suicide knowledge, beliefs, nor confidence in treating suicidal clients. *Journal of Substance Abuse Treatment, 106,* 29-34. https://doi.org/10.1016/j.jsat.2019.08.012

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