

MODERATORS OF TREATMENT OUTCOME IN DIALECTICAL BEHAVIOR
THERAPY: THE ROLE OF EMOTION REGULATION AND IMPULSIVITY

By

Erin M. Sparapani

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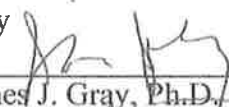
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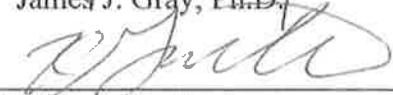
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Chair:


James J. Gray, Ph.D.


Kathleen Gunthert, Ph.D.


Nathaniel Herr, Ph.D.


Anne Parker Wake, Ph.D.


Dean of the College of Arts and Sciences

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DEDICATION

This project is dedicated to the hard-working clients and dedicated clinicians of the Wake Kendall Group, PLLC, without whose participation this project would not have been possible. I am eternally grateful for the excellent training and lifelong friendships established during my work in your practice.

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ABSTRACT

Dialectical Behavior Therapy (DBT) has been shown to be effective in treating Borderline Personality Disorder (BPD) (Linehan, 1993). Less is known about how it works, or for whom. As emotion regulation, impulsivity, and experiential avoidance have been shown to be related to BPD symptoms, the current study sought to extend early evidence that these personality variables moderate treatment outcome. Participants included 30 clients engaged in DBT in a private practice in the Washington, DC metropolitan area. At the start of treatment, measures of difficulties in emotion regulation, impulsivity, and experiential avoidance were collected. Every two months, following each DBT group skills module, a brief self-rating of BPD symptoms was collected. Results indicated that suicidal ideation, impulsivity, anger, unstable identity, and paranoia all decreased over time in treatment. Emotion regulation deficits and impulsive tendencies moderated specific BPD symptoms. Those who initially indicated that they had a limited emotion regulation skills repertoire and difficulty thinking prior to action were helped the most in terms of their unstable identity and paranoia, when

controlling for initial ratings of those symptoms. Difficulties with task persistence and difficulties engaging in goal-directed behavior while distressed were associated with the highest final ratings of suicidal ideation, unstable identity, and paranoia. Greater impulsive tendencies predicted greater difficulty with fear of abandonment at the final assessment. There was no evidence for the moderation of impulsive behaviors, dissociation, unstable relationships, unstable mood, or anger. Hypotheses regarding suicide attempts, suicidal threats, and self-injury were not tested, given the low base rates observed in this sample. Results were interpreted in light of extant knowledge of BPD symptoms as well as various outcome studies of DBT. The present study contributes to the understanding of the effectiveness of DBT in private, outpatient settings. Though the sample size is limited, such data are useful for clinicians in terms of determining who will be helped most in DBT, and what specific skills might best address specific symptoms.

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CHAPTER 1

INTRODUCTION

Dialectical Behavior Therapy (DBT) is one of the most effective empirically-supported treatments for Borderline Personality Disorder (BPD) (Robins & Chapman, 2004). BPD symptoms include the following: suicidal behavior, self-harm, impulsivity, emotion dysregulation, intense anger, intense and instable interpersonal relationships, dissociation, paranoia, and emptiness (DSM-5, American Psychiatric Association, 2013). Because of the intensity of the symptom picture, BPD is notoriously difficult to treat and related to high health care utilization, including many psychiatric hospitalizations (Linehan, 1993). Approximately 20 years ago, DBT was developed to address the multiple problematic behaviors in a comprehensive way. In short, the central dialectic in DBT combines techniques of acceptance and change, taking a behaviorist approach to treatment. In addition, DBT offers a unique case conceptualization based on a specific biosocial theory of BPD, which describes biologically-based emotional vulnerability in the context of an invalidating environment as the etiology of the disorder. It is delivered in multiple modalities in order to facilitate acquisition and generalization of more adaptive behavioral skills. Individual therapy focuses on the client's "life worth living" goals. Group skills training sessions use a psychoeducational approach to teaching mindfulness, emotion regulation, interpersonal effectiveness, and distress tolerance skills in order to address behavioral deficits inherent in the disorder. Phone coaching with the

individual therapist serves to generalize skill-building and provide crisis intervention. Finally, the consultation team serves to support all therapists in the often-challenging delivery of DBT and to help therapists remain true to the model (Linehan, 1993).

Several randomized control trials (RCTs), the gold standard for determining whether or not an intervention is effective for a given population, have demonstrated that DBT is effective in reducing suicide attempts, self-harm, psychiatric emergency room admissions, and treatment drop-out (see review in Robins & Chapman, 2004; Pasciency & Connor, 2011). Given its relative success and the significant overlap between BPD features and other psychiatric symptoms, as well as significant comorbidity with other psychiatric disorders, DBT has been adapted to treat other populations with some efficacy, including substance abuse and dependence (Harned et al., 2008; Linehan et al., 1999; 2002), eating disorders (Hill, Craighead, & Safer, 2011; Kroger et al., 2010; Telch, Agras, & Linehan, 2001), depression in older adults (Lynch et al., 2006), suicidal adolescents (Miller et al., 2007), and individuals in correctional settings (Shelton et al., 2009). Recognizing the central role of dysregulation in mood and anxiety disorders, emotion regulation skills have been added to traditional cognitive behavioral therapy (CBT) protocols for mood and anxiety disorders, improving the efficacy of CBT (Berking et al., 2008). Despite the overwhelming evidence suggesting DBT works, less is known about how it works, or for whom.

Cronbach and Snow (1977) have outlined key methodological and conceptual considerations for examining aptitude, or a quality that makes an individual ready to learn in a given environment, in the context of that environment as compared to others. This is termed the “aptitude-by-treatment interaction”, or ATI (Cronbach & Snow, 1977). While

the present study does not compare differing treatments, it does examine individual trait-level variables as potential aptitude indicators for DBT. In particular, Cronbach and Snow (1977) identified two distinct patterns of matching aptitude and treatment that are of relevance to this study. First, they identified a “capitalization” strategy in which a learner’s predispositions are an asset to treatment that tailor instruction to the capabilities of the learner. Second, an individual might be a good match for a given treatment when that treatment allows for that person to compensate for skills that does not come naturally to him or her, in the “compensation” pattern (Cronbach & Snow, 1977). The following review of literature will highlight what is known about potential presumed aptitudes as they relate to BPD criteria and DBT treatment at this time, in light of “capitalization” and “compensation” strategies.

Recent research has begun to investigate which components of DBT are the most active agents in therapeutic change. Andion and colleagues (2012) compared individual DBT only with individual plus group, and found no differences between groups on self-harm, suicide attempts, or emergency room visits, with improvement on all areas for both groups. This was interpreted to mean that individual therapy may be the more active component of DBT. Similarly, in order to test the hypothesis that group skills contribute most to symptom improvement, DBT skills group was added to non-DBT individual therapy in one group and compared to non-DBT individual therapy alone in another group. However, no differences were seen between these two groups on any outcomes, suggesting that individual therapy may contribute to other differences expected through DBT (see Robins & Chapman, 2004). Deconstruction studies for determining the active components of DBT are made difficult by comparisons to non-DBT individual therapy,

lack of consultation team, and other problems with control using a treatment-as-usual (TAU) comparison group.

Individual engagement in any treatment is crucial for success in treatment outcome. In DBT, one clear measure of engagement is skills use. Neacsiu, Rizvi, and Linehan (2010) found that higher rates of skills use as indicated by diary card data predicted improved DBT outcomes. However, diary card completion alone does not necessarily equate with skills use; nor does it address factors that could contribute to diary card completion, such as social desirability or therapeutic alliance. In a separate study in a university outpatient clinic, skills use was associated with a decrease in affective instability, negative relationships, and identity disturbance. Specifically, emotion regulation and mindfulness skills use were associated with significant reduction in identity disturbance features (Stepp et al., 2008). Therefore, both global and specific skills use may predict specific changes in BPD symptoms. This suggests that specific DBT skills allow for individuals to compensate for deficits in those areas (Cronbach & Snow, 1977). Other proposed mechanisms of change include extensive use of chain analysis, mindfulness techniques, and the balance of dialectical strategies (Lynch et al., 2006), but little evidence collected to date supports which of these agents in DBT are predictive of change.

Empirical investigations of individual differences in DBT response beyond symptom picture are relatively few at this time, as much of the research has been devoted to establishing efficacy and applicability in other populations. According to a recent review of psychotherapy for BPD, four of five studies examining symptom severity demonstrate a link between BPD symptom severity and success in treatment while the

fifth did not. Overall, those with greater symptom severity were helped the most in psychotherapy for BPD (Barnicot et al., 2012). Analysis of individual symptoms found that anger and dissociation severity yielded inconsistent and contradictory findings regarding the role of those particular symptoms on treatment outcome (Barnicot et al., 2012). As the authors note, it is difficult to tease apart the inconsistencies, given differing operational definitions among studies. Therefore, it is not clear if specific symptom patterns allow for capitalization or compensation (Cronbach & Snow, 1977).

Given the diverse set of symptom criteria for BPD, one means of predicting treatment response may begin with identifying different symptom profiles as potential mechanisms of change. Lenzenweger and colleagues (2012), at the Cornell Personality Disorders Institute, recently tested neurobehavioral models and object relations models for BPD in a principal components analysis to determine how symptoms cluster and change together over time in their ongoing RCT of DBT, transference-focused psychotherapy, and supportive dynamic psychotherapy to treat BPD. Ultimately, their analysis revealed three areas of symptoms that accounted for 61% of the variance across treatments. One factor was related to anger and aggression; another to conflict tolerance and behavioral dyscontrol (anxiety, depression, and impulsivity); and the final to social adjustment and self-acceptance (Lenzenweger et al., 2012). While the constructs examined in this particular study are best described as defense-focused or psychodynamic in nature, as opposed to the behaviorist approach taken in DBT, the authors raise an important point: “This raises the interesting possibility that patient-level features may work in concert with treatment and this process may relate to particular domains of change,” (Lenzenweger et al., 2012). Cronbach & Snow (1977) outline research findings

related to education in this area. With that in mind, an examination of patient-level variables as they relate to symptoms follows.

Impulsivity and Borderline Phenomena

One difficult-to-treat and costly symptom set in BPD is impulsive behavior, including suicidal behavior, self-injury, and non-suicidal self-damaging behaviors. More importantly, impulsivity as a trait is implicated in self-harm and suicidality even beyond the diagnosis of BPD (e.g., Klonsky, 2007). However, impulsivity is not a unidimensional construct, with several theories describing different key components (Barratt, 1985; Dougherty et al., 2009; Whiteside & Lynam, 2001). One line of research conceptualizes it as a pattern of dysfunction in the approach/avoidance system, with inadequate insensitivity to punishment or reinforcement, or excessive pursuit of pleasure characterizing the type of impulsive behavior. The maladaptive patterns of reinforcement for a given behavior are key in this model, regardless of the behavior's topography (Farmer & Golden, 2009). With that in mind, someone may continue an impulsive behavior, like drug abuse, because they are sensation-seeking, because they are insensitive to the punishing effects of withdrawal and other quality of life losses, or because they prefer to avoid negative affective experience (Farmer & Golden, 2009). Independent models of BPD impulsivity tend to favor the latter: that impulsive behaviors function as means of avoiding negative affect (e.g., Gratz, 2007; Selby & Joiner, 2009).

As DBT relies heavily on behavioral chain analysis, it is theorized that attending to internal and external cues, coupled with distress monitoring before and after a behavior, may help to address this maladaptive approach/avoidance system. However, only two studies thus far have linked improved self-report impulsivity to improvement in

DBT. In a German inpatient sample, comparing DBT to TAU, impulsivity decreased in DBT alone over a 17.5 month period (Bernheim et al., 2011). While this is promising and consistent with the hypotheses, most DBT in the United States occurs on an intensive outpatient basis. Further, the impulsivity measure used in this study had a factor structure that did not hold, limiting the purported utility of the model. In a partial hospitalization program, endorsement of the self-damaging impulsive behaviors criterion on the Structured Clinical Interview for the DSM – Axis II at intake, combined with relationship disturbance and emptiness, led to the greatest improvements at a three-month follow-up (Yen et al., 2009). This also confirms that DBT is useful for treating the population it was designed to treat. Again, this comes from a different treatment paradigm than the standard outpatient DBT, and did not use a self-report measure of impulsivity. Therefore, further work must be done to see what predictive value individual differences in impulsivity have in determining treatment outcome in DBT. It is not clear from the literature whether or not individual differences in impulsivity are expected to be capitalized or compensated (Cronbach & Snow, 1977). Determining the role of impulsivity as a potential aptitude indicator in DBT is one goal of the current study.

Two separate theories have been established to generate a factor structure that can explain impulsivity. The Barratt Impulsiveness Scale (BIS; Barratt, 1985) supports a three-factor model to describe impulsivity. Attentional impulsiveness is composed of task-focus and persistence as well as the inability to ignore competing thoughts. Non-planning impulsivity assesses the enjoyment of mental challenges and the tendency to think things through (Barratt, 1985). One study found that non-planning impulsivity was related to emotional avoidance in self-report in a nonclinical sample. This was not

confirmed by a computerized delay discounting task, which measures behavioral impulsivity in an evaluative context (Berghoff et al., 2012). Finally, motor impulsiveness addresses the tendency to act in the spur of the moment (Barratt, 1985). However, there is evidence of low predictive utility in this model as it relates to expected clinical phenomena and other personality variables: particularly with motor impulsivity (Whiteside & Lynam, 2001). Further, many studies use the accompanying self-report measure without the factor structure, which limits its clinical utility and neglects the theory behind the model. Recently, Whiteside & Lynam (2001) used factor analysis to generate a new factor structure for explaining impulsivity, expanding on Barratt's work and incorporating new clinical data with various existing measures of impulsivity and the Five Factor Model. This resulted in a four factor structure called the UPPS model, including Negative Urgency, lack of Premeditation, lack of Planning, and Sensation Seeking (Whiteside & Lynam, 2001). Negative Urgency in particular has been linked to borderline features (e.g., Lynam et al., 2011), as it is defined as the need to reduce intense negative affect immediately.

The evidence linking impulsivity and various impulsive behaviors is discussed below. It should be noted that several terms have historically been used to describe self-injury, including parasuicidal behavior, self-injurious behavior, self-harm, self-mutilation, and non-suicidal self-injury. For the sake of continuity, and to remain similar to the language used in DBT, self-injury will be used in this document. Self-injury is defined as the deliberate damaging of one's own bodily tissue without suicidal intent. Suicidal behaviors are described as they are in each study, ranging from attempts to ideations.

Suicide. One means of selecting predictive variables in understanding how and for whom DBT works is by consulting the literature on the problematic behaviors themselves. One longitudinal study of depressed or dysthymic individuals engaged in treatment and followed ten years later found that borderline features uniquely and robustly predict suicide attempts, suggesting that the likelihood to attempt suicide is largely a predisposition of personality pathology (May, Klonsky, & Klein, 2012). Depression severity, hopelessness, childhood maltreatment, psychosocial adjustment, and substance abuse histories did not predict suicide attempts significantly after borderline features were entered in the regression (May, Klonsky, & Klein, 2012). However, this does not identify *which* aspects of BPD were implicated in the predisposition for attempts. Several other studies suggest suicide attempts are strongly associated with impulsivity across diagnoses and regardless of symptom severity (Brodsky et al., 1997; Mann et al., 1999; Mehlum, 2009; Soloff et al., 2000). Three separate studies reported in the same paper support this and further distinguish which facets of impulsivity in the UPPS model differentially predict attempts from the many people who have suicidal ideation. Two of the three samples, college students and high school students, showed that Urgency distinguished those who had considered or attempted suicide from those who had never been suicidal (Klonsky & May, 2010). Lack of premeditation distinguished those who had attempted suicide from those who had thought about suicide and those who were never suicidal (Klonsky & May, 2010). Therefore, regardless of the definition of impulsivity, there is overwhelming evidence that impulsivity predicts suicide attempts. It appears that impulsivity related to emotions – Negative Urgency – as

well as a lack of Premeditation or consideration of consequences are the facets of impulsivity that are most useful in predicting of suicide attempts.

Self-Injury. Similar to suicide, self-injury has been theoretically linked to underlying impulsivity. Self-injury is largely present even outside of BPD or other known diagnoses in adolescents and young adults, such that 15% of adolescents and 17% of college students acknowledge having engaged in self-injury in their lifetime (Glenn & Klonsky, 2010). Several independent labs have tested the UPPS model to explain self-injury. In a study with 168 high school and college students comparing injurers and non-injurers, self-injury was best predicted by the Urgency dimension of impulsivity. This was true even after controlling for anxiety, depression, and substance use (Glenn & Klonsky, 2010). Among injurers, Perseverance and Premeditation also contributed to the model of self-injury. Specifically, lack of Perseverance was related to more frequent and recent episodes of self-injury, while lack of Premeditation was only related to more frequent episodes of injury (Glenn & Klonsky, 2010). A study of adolescent psychiatric inpatients with a history of self-injury showed that they tended to engage in self-injury with low planning, and in the absence of drugs/alcohol, and experienced low physical pain as a result (Nock & Prinstein, 2005). Further, an ecological momentary assessment study in an adolescent community sample found that the desire to self-injure was likely to occur in the context of a desire to engage in other impulsive behaviors like bingeing and purging or substance use, in 15-20% of instances (Nock, Prinstein, & Serba, 2010). Greater intensity and shorter duration of self-injury-related thoughts were also more highly related to behavioral engagement in self-injury (Nock, Prinstein, & Serba, 2010).

This all supports an emotional avoidance or escape function of self-injury as the behavior develops in adolescence.

As 10% of chronic self-injurers complete suicide (Linehan, 1993), and both behaviors are partially explained by impulsivity, it is important to examine the function of both behavior classes simultaneously. A study of 76 inpatients in a DC substance abuse center found significant overlap with BPD traits, self-harm, and history of suicide attempts. Sensation Seeking was not related to either suicide or self-injury. The interaction between Negative Urgency and Lack of Premeditation had incremental validity over BPD features for both suicide and self-injury, accounting for 27% of the variance (Lynam et al., 2011). Conversely, BPD features did not have incremental validity over impulsivity for either behavior (Lynam et al., 2011). Therefore, it is possible it is the underlying trait of impulsivity that may predispose sufferers of BPD and other disorders to increased risk of self-harm and suicide, and that the impulsivity itself should be a treatment target. Thus, one of the goals of the present study is to understand how impulsivity is related to symptoms targeted in treatment, as it is quite important in predicting the highest priority treatment targets in DBT.

Substance Abuse. Much of the research on trait-level impulsivity as a maintenance factor in psychopathology and a mechanism of action in psychotherapy comes from substance abuse research. For instance, Dom and colleagues identify impulsivity as a predisposing factor for “experimenting” with drugs early in life, and developing dependence later in life as it sparks a cycle of negative reinforcement (2006). Comparing early- and late-onset abstinent alcoholics in an inpatient program with matched controls, researchers found that early onset groups performed worse on a

delayed discounting task than both controls and late-onset drinkers (Dom et al., 2006).

As this experiment controlled for the effects of illicit drug use, authors interpreted it to mean that the impulsivity that predisposes individuals to use drugs at younger ages is a stable trait that remains in spite of therapy. Therefore, impulsivity in younger drug-dependent samples was identified as a future treatment target (Dom et al., 2006).

Similarly, a study of 50 cocaine-dependent subjects in treatment had a higher rate of abuse, severity of withdrawal, and dropout rates if they were more impulsive (Moeller et al., 2001). Fortunately, engagement in long-term substance use treatment may improve impulsivity. A nine-month stay in a therapeutic community showed that impulsivity, measured by the BIS-11, decreased over the course of therapy (Bankston et al., 2009). Thus, self-regulation and impulsivity are implicated as targets in substance use treatment, as they are predictive of successful treatment and treatment retention.

Eating Disorders. There is also significant overlap between self-harm and disordered eating behaviors, on the order of 25-50% of people with bulimia nervosa admitting to a history of self-harm (Peterson & Fischer, 2012). Impulsivity may be a common underlying vulnerability. For those with bulimia nervosa, impulsivity contributes to poorer outcomes (Schnitzler, von Ranson, & Wallace, 2012). Using hierarchical linear modeling, adding thin ideal internalization and impulsivity to traditional cognitive behavioral models accounted for more of the variance in bulimic symptoms than the CBT models alone (Schnitzler et al., 2012). In a three year follow-up for bulimia nervosa CBT, decreased impulsivity and lower shape concern supported recovery (Castellini et al., 2012). Using the UPPS model in a large undergraduate sample, Negative Urgency was the only significant predictor of both bulimia nervosa and

self-injury at baseline (Peterson & Fischer, 2012). There was also a main effect of lack of Premeditation on binge eating, while self-injury at baseline predicted increased purging at follow-up (Peterson & Fischer, 2012). This all suggests that Urgency is a large vulnerability, and that once the various behaviors initiate, they are “self-sustaining” (Peterson & Fischer, 2012). However, clinical data is needed to verify this. This also did not examine the role of distress or affect regulation, which may be confounding variables. The Cascades of Emotion model of the emergence of behavioral dysregulation from emotional dysregulation supports this notion (Selby & Joiner, 2009). This theory asserts that distress intolerance predisposes individuals to a variety of escapist behaviors, which are negatively reinforcing (Selby & Joiner, 2009).

Emotion Regulation

While several explanatory models of BPD exist, Linehan (1993) conceptualizes it primarily as a disorder of emotion regulation. In fact, affective instability and impulsivity within BPD combined make the best predictors of suicidal behavior (Yen et al., 2009). In spite of the agreed-upon importance of emotion regulation in the causal and maintenance models of various psychiatric disorders, definitions of emotion regulation are less agreed-upon. Emotion regulation can be seen as response-focused or antecedent focused, with most definitions focusing on the cognitive, behavioral, and experiential responses to negative emotional stimuli. Self-report measures of emotion regulation tend to address a wide variety of facets, from emotional awareness and clarity to suppression of responses to the behavioral engagement with emotional responses. Specificity on deficits within treatments for particular disorders is just emerging. As emotion dysregulation is postulated as a central mechanism in borderline pathology (Linehan,

1993), literature on emotion dysregulation within BPD is a solid starting point for understanding potential mechanisms of action or moderators in DBT. For instance, a large undergraduate sample found that low emotional clarity and having limited emotion regulation strategies had an indirect effect on BPD symptoms, when controlling for negative affect intensity (Salsman & Linehan, 2012). Further, the inability to engage in goal-directed behavior while distressed and having limited strategies had an indirect effect on BPD symptoms, controlling for emotional reactivity (Salsman & Linehan, 2012). The literature on emotion regulation and behaviors implicated in BPD will be reviewed.

Self-Injury. Self-report and ecological momentary assessment have been used to ask those who self-injure to explain first-hand the reasons for which they choose to self-harm. Self-report data on the reasons for self-injury has been collected in clinical and non-clinical samples. In one study, 215 undergrads with a history of self-injury were given a number of self-report measures on their psychiatric symptoms and the functions of their self-harm (Klonsky & Olino, 2008). The majority, 61%, had few clinical symptoms and appeared to engage in self-harm in an experimental fashion. An additional 17% had mild BPD features and a slightly earlier onset of self-injury (Klonsky & Olino, 2008). The other two subgroups were far more symptomatic and severe in their self-injury. One engaged in self-harm both for their own sense of relief and to be reinforced interpersonally. The final group, comprising 10% of the self-injurers, was characterized by a history of suicidality. This group engaged in self-injury to regulate affect, and had the most severe self-injury history (Klonsky & Olino, 2008). In a review of the literature on the functions of self-injury, which looked at multiple assessment methods, affect

regulation reasons were the most frequently endorsed motivations for self-injury in adult samples. In adolescent samples, this was also true, but with less of a stark difference between this and other motivations seen in the adult sample (Klonsky, 2007). While other reasons are often listed, seeking of attention was very rarely endorsed as the primary reason for engaging in self-harm (Klonsky, 2007). This is consistent with the biosocial theory put forth by Linehan to explain borderline clinical phenomenon such as self-injury and other maladaptive behaviors, in which affect regulation is the primary reason for problematic behaviors (e.g., Linehan, 1993). Thus, distress tolerance and affect regulation are primary goals of DBT and presumed to be mechanisms of action, though little empirical evidence to date has tested this hypothesis.

Finally, two separate studies have preliminary evidence that emotion regulation may be the mechanism of action in improving self-harm. A study of an acceptance-based emotion regulation group that was adapted from DBT but delivered as an adjunctive group treatment saw improvement on emotion regulation, experiential avoidance, self-harm, anxiety and depression compared to TAU (Gratz, 2007). One Dutch RCT comparing TAU and an emotion-regulation-focused CBT plus TAU found that 14.9% of the variance seen in change in suicidal cognitions and self-harm was accounted for by change in emotion regulation (Slee, Spinhoven, Garnefski, & Arensman, 2008). However, it is important to note that this study allowed for any other therapy, including individual therapy and hospitalizations, to be part of the TAU for both groups. Further, the definition of self-harm included suicidal acts (Slee et al., 2008). Though promising, this is far different from the typical level of control expected in an RCT, and limits the

comparisons that can be made to studies examining self-harm with different operational definitions.

Alcohol Use Disorders. One study compared 50 treatment-seeking alcoholics in an inpatient facility to 62 social drinkers on emotion regulation using the Difficulties in Emotion Regulation Scale (DERS: Gratz & Roemer, 2004) and on BPD features. Researchers found that alcoholics had lower awareness of their emotions compared to social drinkers at the initial evaluation, and for those without BPD features, this deficit improved significantly by the end of five to six weeks in treatment (Fox, Hong, & Sinha, 2008). Also, as expected, all alcoholics had lower impulse control at the start of treatment. This deficit only changed for those with BPD features, and those without BPD features showed continued impulse control at discharge (Fox, Hong, & Sinha, 2008). This suggests that some of the success seen in intensive alcohol treatment facility may be attributed to greater emotional understanding and some impulse control, with BPD features moderating outcome. A study of 116 inpatients in an alcohol treatment facility in Germany using a CBT relapse prevention model compared the inpatients, a sample with major depressive disorder (MDD), and a non-clinical sample on measures of emotion regulation and alcohol use. Even after controlling for other psychiatric disorders, deficits in emotion regulation predicted use during treatment and at three months post-treatment (Berking et al., 2011). Notably, broad emotion regulation deficits did not differentiate the alcohol-dependent group from the MDD groups. Specifically, tolerance of negative affect was the only skill to predict alcohol use (Berking et al., 2011). CBT was effective in changing participants' modification and awareness of emotions (Berking et al., 2011), which is consistent with the US inpatient sample

described earlier (Fox, Hong, & Sinha, 2008). Also, a sample of 27 women with BPD in a substance abuse DBT program showed that decreases in substance abuse were related to improvements in emotion regulation at the end of 20 weeks in treatment, while negative mood did not have an effect (Axelrod, Perepletchikova, Holtzman, & Sinha, 2011). It is clear that improvement of emotion regulation, or compensation for such deficits (Cronbach & Snow, 1977) may be one predictor of change in the treatment of alcohol dependence.

Eating Disorders. Models of eating disorders dating back to the 1960s have established emotional dysregulation issues as causal or maintaining factors. In fact, eating disorders and borderline personality disorder have a fair amount of comorbidity, which makes sense as impulsive eating patterns partially satisfies one criterion of BPD. An inpatient eating disordered sample with comorbid self-injury indicated that their self-injury served affect regulatory functions, such that self-injury provided relief from psychological pain (Claes et al., 2010). Considering the role of emotions, adaptations of DBT have been successful in binge eating and bulimia nervosa applications (Telch, Agras, & Linehan, 2001). Ben-Porath, Wisniewski, & Warren (2009) compared eating disordered patients in a DBT-informed therapy with and without BPD. The treatment was equally effective in treating eating disordered symptoms for both groups, suggesting it is appropriate for those with comorbid BPD and eating disorders. More notably, while the comorbid group indicated higher emotional dysregulation as indicated by Negative Mood Regulation scores in the beginning of treatment, there were no group differences at the end (Ben-Porath et al., 2009). This suggests that DBT may compensate an underlying skills deficit that predisposes some to maladaptive eating patterns; thereby, reducing both

the target behavior and self-ratings of emotional regulation capability. With this in mind, results from an RCT for DBT-BED showed that those with avoidant personality disorder features started the treatment with greater pathology, but made greater gains in treatment compared to non-comorbid groups (Robinson & Safer, 2012). This suggests that those with comorbid personality disorder features tend to benefit the most from DBT-informed approaches for disordered eating, as compensate for underlying deficits in emotion regulation (Cronbach & Snow, 1977). Highlighting emotional processes as mechanisms of action, binge eaters in CBT for eating disorders show that decreased depression and lower emotional eating lead to less binge eating, with gains maintained at a three-year follow-up (Castellini et al., 2012).

Mood and Anxiety Disorders. Changes in emotion regulation have also been implicated as a mechanism of change in mood disorders. Some neuroimaging data supports the idea that cognitive behavior therapy produces electrochemical and structural change in the brain areas responsible for emotion regulation (Ritchey et al., 2011). A study of DBT modified for MDD used emotional processing as a moderator variable (Feldman et al., 2009). The waitlist control group found that emotional processing led to increased depressive symptoms. The DBT group had the opposite result – that emotional processing led to decreased depressive symptoms (Feldman et al., 2009). Perhaps the form of emotional processing matters. One study of 29 completers of a mindfulness-based cognitive therapy for depression found that increases in mindfulness led to less experiential avoidance and rumination, which led to less depression (Kumar, Feldman & Hayes, 2008). This suggests that more adaptive emotion processing leads to decreases in depression. Other studies have shown that some depression remains at the end of a year

in DBT (e.g., Berking, Neacsiu, Comtois, & Linehan, 2009). This seems paradoxical in a treatment that targets emotion regulation so strongly.

Experiential Avoidance

Another key trait related to borderline clinical phenomena is experiential avoidance. Experiential avoidance can be defined as any effort to avoid any unwanted experience, be it somatic sensations, emotions, thoughts, or situations (Chapman, Dixon-Gordon, & Walters, 2011). Such efforts are generally conceived to be behavioral, whether they refer to behavioral avoidance, thought suppression, substance use, or some other maladaptive behavior that serves an escape function (Chapman, Dixon-Gordon, & Walters, 2011). While emotion regulation includes the understanding of emotions as well as behaviors related to their antecedents and consequences, experiential avoidance is related to avoidance and escape efforts for various types of experience, and is not limited to emotions (Chapman, Dixon-Gordon, & Walters, 2011; Iverson, Follette, Pistorello, & Fruzzetti, 2012). While avoidance works effectively in the short term, in the long-term, it is associated with maladaptive behavioral outcomes such as substance abuse, self-harm, and maintenance of anxiety disorders (e.g., Chapman, Dixon-Gordon, & Walters, 2010; Chapman, Specht, & Cellucci, 2005; Gratz, Tull, & Gunderson, 2008; Hulbert & Thomas, 2010; Iverson et al., 2012; Neacsiu et al., 2014). Thus, paradoxically, avoiding unwanted experience in the short-term actually increases distress in the long-term. Given the level of affective intensity inherent in BPD, experiential avoidance in BPD has become a significant area of interest in research in recent years. Several independent laboratories have shown a clear link between experiential avoidance and BPD (Chapman, Specht, & Cellucci, 2005; Neacsiu et al., 2014), over and above the psychopathological

distress associated with that condition (Iverson et al., 2012). Some evidence suggests that levels of experiential avoidance can help distinguish between BPD and non-personality disordered groups (Gratz, Tull, & Gunderson, 2008). It is for this reason that DBT contains a variety of acceptance-based skills. In fact, Linehan (e.g., 1993) conceptualizes DBT as an exposure-based therapy designed to help individuals understand and tolerate emotions as they are: a skill that has proven to be quite difficult for those with BPD.

As affective intensity and emotional dysregulation are central to BPD, one would expect to see more avoidance efforts for those with BPD as compared to other groups. It should be noted that studies linking experiential avoidance and BPD show this distinction over and above affect intensity (Gratz, Tull, & Gunderson, 2008) and specific types of negative affect (Neacsiu et al., 2014). Given the negatively reinforcing effects of avoidance, individuals high in experiential avoidance have a more difficult time making progress in treatment (Neacsiu et al., 2014). Related to this, experiential avoidance predicts the frequency of non-suicidal self-injury (Hulbert & Thomas, 2010), which is a top target in DBT. One study found that experiential avoidance was related to BPD symptoms after controlling for depression and emotion regulation difficulties (Iverson et al., 2012). However, the study demonstrating this link used a global index of emotion regulation, which has been shown to be a multidimensional construct (Gratz & Roemer, 2004). Relations between experiential avoidance and specific dimensions of emotion regulation are less clear, and an important area for future study.

Many treatment studies exploring possible mechanisms of action in non-DBT empirically supported therapies have evaluated mindfulness (the theoretical opposite of experiential avoidance) and experiential avoidance itself as agents of change in

treatments for various disorders. In an empirically-based group intervention for generalized anxiety disorder, experiential avoidance was shown to account for symptom change over and above change in worry, the hallmark of generalized anxiety disorder (Hayes, Orsillo, & Roemer, 2010). Similarly, an exposure-based CBT group intervention for depression showed that an increase in mindfulness skills predicted reduced depression, experiential avoidance, and rumination (Kumar, Feldman, & Hayes, 2008). Such studies support the notion that mindfulness, which precludes avoidance and facilitates new learning, are particularly crucial skills for those who come into treatment reporting experiential avoidance. In addition to specifically increasing mindfulness skills, DBT principles stipulate that mindfulness is, in fact, a cornerstone of every skill. It is why mindfulness skills are taught at the beginning of every module (Linehan, 1993).

At this time, a few studies highlight specific ways in which DBT targets experiential avoidance in relation to specific BPD symptoms and related disorders. For example, one study in a university outpatient clinic found that changes in emotion regulation and mindfulness during DBT were uniquely related to change in identity disturbance features in BPD (Stepp et al., 2008). A follow-up study of the RCT comparing community treatment by experts (CTBE) and DBT found that DBT led to greater decreases in experiential avoidance and anger expression as compared to CTBE (Neacsiu et al., 2014). Again, both sets of findings suggest that specific deficits are compensated for over time in DBT (Cronbach & Snow, 1977). Finally, another study has shown that experiential avoidance may moderate depression in DBT for those with BPD (Berking et al., 2009). Latent difference analysis, which allows for time-lag data analysis, found that those high in emotional avoidance show less subsequent reduction in

depression over one year in DBT. As the pattern was not observed in the reverse, it is interpreted to mean that emotional avoidance as a trait is a hindrance to the reduction of depressive symptoms for those with BPD (Berking et al., 2009). Such individuals were unable to compensate for such deficits in DBT as they might be in other treatments. This study is consistent with the above-mentioned non-DBT study that demonstrated that increased mindfulness was related to reductions in depression and experiential avoidance (Kumar, Feldman, & Hayes, 2008). As such, mindfulness skills are targeted in DBT so as to increase contact with and acceptance of reality. Further research is necessary in order to establish specific ways in which experiential avoidance is related to progress in DBT, and to distinguish between experiential avoidance and facets of emotion regulation.

The Current Study

The evidence discussed above clearly demonstrates that impulsivity, emotion regulation deficits, and experiential avoidance are implicated in the clinical severity of borderline personality disorder. DBT is thought to address these areas through the teaching of specific skills and ensuring the generalization of those skills, which is partially confirmed through evidence that skills use mediates symptom improvement (Neasciu et al., 2010; Stepp et al., 2008). Research on moderator variables in psychotherapy suggests that examination of individual differences as being of utmost importance for guiding future interventions and helping predict who will benefit from treatment and who will struggle. Cronbach and Snow (1977) outlined these methodological and conceptual considerations as aptitude-by-treatment interactions, in which individuals may capitalize on or compensate for their individual differences on a given variable. With respect to BPD, domains of change have been identified across

treatment types (Lenzenweger et al., 2012). The current study examined the role that impulsivity, emotion regulation, and experiential avoidance traits might have in predicting ratings of BPD symptoms over time in DBT. Lenzenweger and colleagues (2012) have found that BPD symptoms tend to cluster in the domains of conflict tolerance and behavioral dyscontrol, aggressive dyscontrol, and social adjustment/self-acceptance. This study indirectly addressed this notion by seeing how specific trait-level deficits relate to target DBT behaviors and domains. Early evidence has suggested that trait-level impulsivity as well as the presence of impulsive behaviors are predictive of greater improvement in DBT (Bernheim et al., 2011; Yen et al., 2009). However, this has not been replicated in outpatient samples, or demonstrated in multifaceted models of impulsivity. In addition, there is evidence that emotion regulation improves in emotion regulation group therapies and mediates behavioral outcomes such as self-harm (Gratz, 2007; Slee et al., 2008). Overall, it was thought that DBT would allow for individuals to compensate for deficits in emotion regulation (Cronbach & Snow, 1977). It was unclear whether or not impulsivity and experiential avoidance would allow for compensation of those deficits in DBT: thus, this portion of the study was somewhat exploratory in nature. This was examined in a comprehensive DBT program in a group private practice in the Washington, DC, metropolitan area. Participants were administered measures of BPD behavior severity, emotion regulation traits and impulsivity traits throughout one year in treatment. Impulsivity was measured by the UPPS, and emotion regulation was measured by the Difficulties in Emotion Regulation Scale. These measures, and the brief behavioral inventory, are measured as a routine part of clinical treatment at this particular clinic.

Hypotheses

Hypothesis 1. Self-injury and suicidal behaviors will decrease over time. This will be tested by running t-tests comparing suicide attempts, suicidal thoughts, suicide threats, and self-injury scores and final suicide attempt, suicidal thought, suicidal threat, and self-injury scores at the initial and final assessment points.

Hypothesis 2. Impulsive behaviors will decrease over time. This will be tested by running t-tests comparing initial and final impulsive behavior scores.

Hypothesis 3. Self-rated fears of abandonment and unstable relationships will decrease over time. This will be tested by running t-tests comparing initial and final fear of abandonment and unstable relationship scores.

Hypothesis 4. Self-rated unstable identity, emptiness, and paranoia will decrease over time. This will be tested by running t-tests comparing unstable identity, emptiness, and paranoia scores at initial and final assessment points.

Hypothesis 5. Self-rated unstable mood and excessive anger will decrease over time. This will be tested by running t-tests comparing initial and final unstable mood and excessive anger scores.

Hypothesis 6. Emotion regulation, impulsivity, and experiential avoidance were expected to be related to borderline symptoms. Specifically, Clarity, Strategies, Goals, Impulsivity, and Nonacceptance from the DERS, Urgency and Sensation Seeking from the UPPS, and the AAQ-II scores were expected to be related to borderline symptoms. As this study is somewhat exploratory in nature, no specific predictions with respect to individual scales or specific symptoms were made. Lack of Premeditation and Lack of Planning were not expected to be related to borderline symptoms.

Hypothesis 7. Emotion regulation tendencies were expected to moderate suicidal, self-harm, and impulsive behavior frequency over time in treatment. Specifically, it was expected that emotion regulation difficulties as measured by total DERS scores would predict lower levels of suicidal, self-harming and impulsive behaviors at the final assessment point, after controlling for baseline level of suicidal, self-injurious, and impulsive behaviors, as well as time in study.

Hypothesis 8. Specific facets of emotion regulation are welso expected to moderate suicidal, self-harming, and impulsive behaviors in DBT. Thus, DERS subscores on Clarity, Nonacceptance, and Strategies are expected to be most related to suicidal, self-harming, and impulsive behaviors after controlling for the initial behavioral assessment and time in study. This will be based on literature suggesting the specificity of those deficits in relation to BPD (e.g., Gratz, 2007; Salsman & Linehan, 2012).

Hypothesis 9. It was expected that impulsivity scores will moderate treatment outcome, such that levels of impulsivity as measured by the UPPS would predict frequencies of suicidal, self-injurious and impulsive behaviors at the final assessment point, after controlling for baseline level of suicidal, self-injurious, and impulsive behaviors. No specific prediction was made with respect to direction, given the lack of literature available in this area.

Hypothesis 10. Specific facets of impulsivity were also expected to moderate suicidal, self-injurious and impulsive behaviors in DBT. Based on evidence implicating Urgency and Sensation Seeking as being particularly relevant treatment targets in BPD (e.g., Lynam et al., 2011), Negative Urgency and Sensation Seeking are expected to be most closely related to suicidal, self-injurious, and impulsive behaviors after controlling for the

initial behavioral assessment and time in study. Lack of Perseverance and lack of Premeditation were not expected to be related to these behaviors. No specific prediction was made with respect to direction of influence.

Hypothesis 11. It was expected that experiential avoidance scores would moderate treatment outcome, so that levels of experiential avoidance as measured by the AAQ-II would predict frequencies of suicidal, self-injurious and impulsive behaviors at the final assessment point, after controlling for baseline level of suicidal, self-injurious, and impulsive behaviors. No prediction was made with respect to direction of influence, given the inconsistent literature in this area.

Hypothesis 12. A final set of regressions was run incorporating emotion regulation, impulsivity, and experiential avoidance variables to test their relative influence while controlling for initial self-ratings of borderline symptoms. It was expected that impulsivity would be related most to suicidal and self-injurious behaviors, given evidence implicating impulsivity as central in predicting the development of such behaviors (e.g., Glenn & Klonsky, 2007).

Hypothesis 13. Emotion regulation tendencies were expected to moderate dissociation, unstable mood, anger, fear of abandonment, unstable relationships, unstable identity, emptiness, and paranoia over time. Specifically, it was expected that emotion regulation difficulties as measured by total DERS scores would predict lower levels of these variables at the final assessment point, after controlling for baseline level of each symptom and time in study. As there is little evidence to date examining moderation of these symptoms specifically, no specific predictions were made with regard to each target BPD symptom.

Hypothesis 14. Specific facets of emotion regulation were also expected to moderate dissociation, unstable mood, anger, fear of abandonment, unstable relationships, unstable identity, emptiness, and paranoia in DBT. Thus, DERS subscores of Clarity, Nonacceptance, and Strategies were expected to be most related to these symptoms after controlling for the initial behavioral assessment and time in study. This was based on literature suggesting the specificity of those deficits in relation to BPD (e.g., Gratz, 2007; Salsman & Linehan, 2012). However, no specific predictions were made with regard to specific symptoms, given the somewhat exploratory nature of this study.

Hypothesis 15. It was expected that impulsivity scores would moderate treatment outcome, such that high levels of impulsivity as measured by the UPPS would predict higher ratings of dissociation, unstable mood, anger, fear of abandonment, unstable relationships, unstable identity, emptiness, and paranoia at the final assessment point, after controlling for baseline levels of these behaviors.

Hypothesis 16. Specific facets of impulsivity were also expected to moderate dissociation, unstable mood, anger, fear of abandonment, unstable relationships, unstable identity, emptiness, and paranoia in DBT. Based on evidence implicating Urgency and Sensation Seeking as being particularly relevant treatment targets in BPD (e.g., Lynam et al., 2011), Negative Urgency and Sensation Seeking were expected to be most closely related to these behaviors after controlling for the initial behavioral assessment and time in study. Lack of Perseverance and lack of Premeditation were not expected to be related to these symptoms. As this study was fairly exploratory in nature with respect to these symptoms, no symptom-specific predictions were made.

Hypothesis 17. It was expected that experiential avoidance scores would moderate treatment outcome, so that high levels of experiential avoidance as measured by the AAQ-II would predict higher ratings of dissociation, unstable mood, anger, fear of abandonment, unstable relationships, unstable identity, emptiness, and paranoia at the final assessment point, after controlling for baseline level of these symptoms.

Specifically, it was expected that those initially indicating higher levels of experiential avoidance would have lower ratings of interpersonal, intrapersonal, and affective symptoms at the final assessment point.

Hypothesis 18. To test whether or not a combination of impulsivity, experiential avoidance, and emotion regulation difficulties moderate dissociation, unstable mood, anger, fear of abandonment, unstable relationships, unstable identity, emptiness, and paranoia, a final set of regressions was run incorporating emotion regulation, impulsivity, and experiential avoidance, while controlling for time in study and initial self-ratings of borderline symptoms. It was expected that emotion regulation would be related most to these symptoms, given the centrality of emotion regulation in DBT conceptualizations of BPD (e.g., Linehan, 1993; Robins & Chapman, 2004).

CHAPTER 2

METHOD

Participants

Participants in this study included clients enrolled in the Dialectical Behavior Therapy program at a local private practice outpatient clinic in the Washington, DC, metropolitan area. Clients were 87% female, and ranged in age from 19-54 ($M=30.79$, $SD=9.68$). This is consistent with other studies of DBT (Robins & Chapman, 2004). No clients were excluded by gender, age, or any other demographic variable. Applicants to the DBT program are given a brief description of the program, and are asked to indicate their goals for treatment, history with self-harm and suicidality, treatment history, known diagnoses, and medication. Participants are only excluded from the treatment program in cases of cognitive disability and severe psychotic symptoms that are thought to interfere with the ability to learn skills. The therapists in the treatment team are from a variety of training backgrounds. As validated diagnostic instruments are not routinely used in the intake process, diagnostic data were unavailable.

The DBT Program. The DBT program was comprised of approximately 10-12 clinicians at any one time who were all intensively trained in DBT and received ongoing supervision with a supervisor who trains others in DBT. As with any standard DBT program, the DBT program examined in this study includes individual DBT therapy,

group therapy, telephone coaching, and a weekly consultation team meeting to help ensure that the DBT protocol is being followed. As a standard part of treatment, clients filled out various self-report questionnaires. Consistent with the recommendations of the private practice's partners and the ethical procedures recommended by the American University Institutional Review Board (IRB), clients had the option of consenting to have their questionnaire data used for the current study. Demographic data on the clients who elected to be a part of the study is not available, so as to remain consistent with IRB requirements protecting the anonymity of those who did and did not elect to participate in this study.

During the time period of the study, 85 participants were enrolled in the program and eligible to participate in research. Of this 85, 12 dropped out before their data had been collected. Thus, 73 were eligible to participate. 48 consents were returned, at a rate of 65.7%. Fifty-one of 73 intake packets were received, and of a possible 219 behavioral inventories, 105 were received, giving overall data completion rates of 69.8% to 47.9%. Intake packets consisted of measurements of emotion regulation, impulsivity, experiential avoidance, depression, and anxiety. Every two months, BPD symptoms were assessed in a short self-report form created for the clinic. Notably, some intake packets were not fully completed (e.g., missed part of a two-sided assessment or did not turn in a given measure). Total counts for each individual scale are reported below along with reliability characteristics. Ultimately, an individual's data was considered "complete" for regressions testing Hypotheses 7-18 when participants had at least two symptom reports and an intake packet, resulting in a total sample size ranging from 27-30, based on the

subscale reported. Overall, 34 had consented to participate: 4 of these participants had incomplete data for all analyses.

Roughly half of the participants in the study had spent six months or less in DBT. Nine had spent two months, seven had spent four months, and two had been in treatment for six months. Seven had spent eight months, six had spent ten months in DBT, and 3 had finished their year-long contract at 12 months or more.

Materials

The self-report questionnaires in this study were a subset of the questionnaires used in the standard DBT pre-treatment procedure at the private practice clinic. They were used to monitor progress, provide feedback for clients on their functioning, and guide intervention strategies. See Tables 1-4 in Chapter 3 for a complete presentation of sample norms and correlation matrices.

Emotion Regulation. Emotion regulation was assessed by the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). It is composed of 36 items measured on a 1 to 5 Likert scale, with six distinct subscales. Clarity and Awareness describe the perceived clarity of and attention to internal emotional states (sample items: Clarity, “I am confused about how I feel,”; Awareness, “I pay attention to how I feel.”). Nonacceptance assesses the secondary self-judgment of emotional states (sample item: “When I’m upset, I become embarrassed for feeling that way.”). Goals and Impulse subscales refer to one’s behavior while in an emotional state. Specifically, Goals addresses the inability to engage in goal-directed behavior while overcome with emotion, and Impulse refers to the inability to refrain from acting on impulses while upset (sample items: Goals: “When I’m upset, I have difficulty getting work done,”; Impulse: “When

I'm upset, I become out of control.”). Strategies addresses the perceived lack of effective skills for dealing with negative affect (sample item: “When I'm upset, I believe I will remain that way for a long time.”). The DERS has demonstrated strong internal consistency and predictive validity. In its original validation, it was shown to predict history of self-harm and intimate partner violence, two clinically relevant phenomena (Gratz & Roemer, 2004). In the current study, it had strong reliability ($N=41$; $\alpha=.87$), and the subscales had intercorrelations consistent with other studies. See Table 2 in Chapter 3 for a more thorough report of correlations between subscales of all measures.

Impulsivity. Impulsivity was assessed by the UPPS Impulsivity Scale (UPPS; Whiteside & Lynam, 2001). It is comprised of 45 items on a 4-point Likert scale and 4 subscales: Urgency, (lack of) Perseverance, (lack of) Premeditation, and Sensation Seeking.

Urgency assesses the difficulty delaying impulses in the face of strong urges for behavior (sample item: “I have trouble resisting my cravings.”). Perseverance refers to the inability to see tasks through to their completion (sample item: “I finish what I start,” reverse-coded). Premeditation describes the lack of sufficient thought before action (sample item: “I have a reserved and cautious attitude toward life,” reverse-coded).

Sensation Seeking refers to the tendency to pursue excitement (sample item: “I sometimes like to do things that are a bit frightening.”). The UPPS has been used in various populations and has demonstrated strong psychometric properties, such as internal consistency and convergent validity. Its subscales have demonstrated incremental predictive validity in the co-occurrence of self-injury and bulimic symptomology (Peterson and Fischer, 2012), and the original validation found significant criterion-related validity with respect to aggressive behavior, sexual behavior, alcohol

and drug abuse, and anxiety and depression (Whiteside & Lynam, 2001). In the current study, it had strong reliability ($N=41$; $\alpha=.77$). See Table 2 in Chapter 3 for a more thorough examination of the concurrent validity in this sample.

Experiential Avoidance. Experiential avoidance was assessed using the Acceptance and Action Questionnaire – II (AAQ-II; Bond, Hayes, Baer, Carpenter, Guenole, Orcutt, Waltz, & Zettle, 2011). It contains seven items related to experiential avoidance (i.e., “I’m afraid of my feelings”), scored on a Likert scale of 1 to 7 ranging from “Never True” to “Always True”. A summary score indicates the patient’s degree of psychological inflexibility or experiential avoidance, such that greater scores indicate psychological inflexibility and are associated with myriad negative mental health outcomes. Lower scores indicate a degree of psychological flexibility. The AAQ-II was validated with a large and diverse sample across several different clinical and non-clinical settings, and has shown consistent divergent and discriminant validity within and across those settings (Bond et al., 2011). Notably, the AAQ-II predicted dropout from DBT in one study (Rusch et al., 2008). The internal consistency for this sample was strong ($N=42$; $\alpha=.91$). As expected, there was a moderate degree of correlation with subscales of the DERS and UPPS. See Table 2 for a complete correlation matrix.

Depression. Depression was assessed by the Beck Depression Inventory (BDI-II; Beck et al., 1996). The BDI-II is a 21-item self-report measure on the presence and severity of depressive symptoms as measured by the DSM-IV-TR and various depression-associated cognitions. It has been widely used in both clinical and research settings, demonstrating strong reliability and corresponds as predicted to depression severity. The current sample

had strong internal consistency ($N=42$; $\alpha=.93$), and indicated moderate depression on average. For a report of means of all measures, see Table 1 in Chapter 3.

Anxiety. Anxiety was assessed by the State-Trait Anxiety Inventory (Spielberger, 1983).

The STAI is a 40-item measure, with the first 20 referring to momentary physical and psychological anxiety symptoms at the time of assessment, and the second 20 items referring to trait anxiety, or how anxious one generally views oneself. Each item is rated on a 4-point scale. The STAI has demonstrated adequate reliability, with convergent validity as it predicts anxiety and depression (Spielberger et al., 1983). The STAI is used as both a clinical and a research instrument. It had strong reliability ($N=40$; $\alpha=.87$), and indicated moderate anxiety in the sample overall.

Borderline Traits. Linehan (1993) conceptualizes BPD as being organized into five areas of dysregulation: emotional, behavioral, cognitive, interpersonal, and self. Various DBT programs find unique ways of assessing these areas of dysregulation over time for their clients. In the current sample, a 12-item self-report questionnaire was developed for the purpose of tracking progress in treatment. It was administered at the end of every eight-week group skills module. The first part asked participants about the frequency of various self-harming, suicidal, or impulsive behaviors that the participant has engaged in during the last week. (Items include: How many times: have you attempted suicide? Have you physically hurt yourself on purpose? Have you threatened to commit suicide? Have you had thoughts about suicide or wishing you were dead? Have you engaged in self-damaging impulsive behaviors, like substance abuse, disordered eating, reckless driving, risky sex, etc? have you felt outside of your body?) The second part asks about various traits associated with borderline phenomena, evaluated on a 7-point Likert scale.

(Items include: How characteristic for you are/is: unstable or volatile interpersonal relationships? Fear of abandonment/rejection/disapproval? Inability to control anger? Unsure of identity? Feeling empty? Feeling that others are out to get you?). This particular clinic developed this measure as it is perceived to be an easy-to-administer, client-friendly rating of behavior at a given point in time. Because it was developed for clinical use at this site alone, there are no established norms or psychometric data available. Means and standard deviations for the current sample ($N=105$) are reported in Table 3. For all hypothesis tests, each item on this measure was examined as its own dependent variable.

Procedure

As clients entered the DBT program, they were informed of the research process and intended use of the data. They were then given the opportunity to consent to have their data used for research purposes. Once informed consent was obtained, an office administrator and a graduate research assistant de-identified the data and provided it to the principal investigator for data entry and analysis.

At pre-treatment, 6 months, and post-treatment (12 months), clients filled out questionnaires assessing their emotion regulation, impulsivity, experiential avoidance, depression, and anxiety (the DERS, UPPS, AAQ-II, BDI, and STAI). At pre-treatment and every two months (after every group module), clients also filled out self-report indices of borderline symptomatology in DBT.

CHAPTER 3

RESULTS

Initial data screening revealed that scores for the BDI, STAI, AAQ-II, DERS, and UPPS were all normally distributed, with no outliers throughout the sample. For the symptom assessment given every two months, which was created for this practice specifically, psychometric analysis revealed that not all items were distributed normally. Specifically, there was only one suicide attempt reported for the entire sample. With a low base rate, hypotheses regarding suicide attempts were not tested. In addition, four individuals throughout the entire sample reported self-injury episodes, and as such, hypotheses regarding self-injury were not tested. Finally, suicidal threats also had a low base rate, such that only two individuals endorsed having made threats of suicide within the last week, thus hypotheses regarding prediction of suicidal threats were not tested. The low base rates for suicide attempts, self-injury, and suicidal threats are addressed in the discussion chapter.

Data distribution for impulsive behaviors reported in the last week were quite variable and did not meet the assumption of normality. However, the residuals for impulsive behaviors did meet the assumption of normality, supporting the use of the regression analyses reported below. For all other items on the symptom list assessment (suicidal thoughts within the last week, dissociative episodes within the last week, and Likert ratings of unstable relationships, fears of abandonment, unstable mood, excessive

anger, unstable identity, emptiness, and paranoia), assumptions of normality were met.

Please see Table 3 below for a report of means, SDs, and ranges for items.

Given the significant usage of the DERS, UPPS, and AAQ-II within BPD samples, means of all scores are reported below in Table 1 in comparison with other reported norms of borderline personality disorder or healthy samples, based on available data.

Table 1

Sample Norms for DERS, UPPS, and AAQ-II

| Measure | Current Sample | Comparison Group | |
|-------------------|----------------|------------------|---------------|
| | | BPD Sample | Normal Sample |
| DERS | 107.07 (27.70) | --- | 78.0 (20.7) |
| DERS-Clarity | 14.09 (4.17) | --- | 10.6 (3.8) |
| DERS-Awareness | 17.31 (5.25) | --- | 14.3 (4.6) |
| DERS-Strategies | 23.97 (7.61) | --- | 16.2 (6.2) |
| DERS-Impulse | 16.88 (6.04) | --- | 10.8 (4.4) |
| DERS-Goals | 17.93 (4.59) | --- | 14.4 (5.0) |
| DERS-Nonaccept | 16.96 (7.12) | --- | 11.7 (4.7) |
| UPPS | 140.45 (25.44) | --- | --- |
| UPPS-Urgency | 43.64 (10.78) | 41.74 | 32.87 |
| UPPS-Premed | 30.27 (9.91) | 26.05 | 21.85 |
| UPPS-Perseverance | 29.61 (8.68) | 23.85 | 19.90 |

| | | | |
|----------------|---------------|-------|-------|
| UPPS-Sens Seek | 37.70 (10.30) | 31.51 | 26.11 |
| AAQ-II | 33.73 (9.38) | --- | 21.41 |

Note: For DERS, $N=41$; for UPPS, $N=40$; for AAQ-II, $N=42$.

Note: Standard Deviations reported in parentheses.

In order to address the convergent and divergent validity of the measures of emotion regulation, impulsivity, and experiential avoidance, a correlation matrix of the DERS, UPPS, and AAQ-II is reported below.

Table 2

Correlation Matrix for DERS, UPPS, and AAQ-II

| Subscale | Clar | Aware | Imp | Goal | Strat | NA | U | Pm | Pv | SS | AAQ |
|----------|-------|--------|-------|-------|-------|-------|------|-------|------|-----|-----|
| Clar | --- | | | | | | | | | | |
| Aware | .54** | --- | | | | | | | | | |
| Imp | .53** | .28 | --- | | | | | | | | |
| Goal | .49** | .23 | .76** | --- | | | | | | | |
| Strat | .55** | .30* | .80** | .84** | --- | | | | | | |
| NA | .64** | .47** | .55** | .56** | .69** | --- | | | | | |
| U | .47** | .05 | .73** | .65** | .70** | .40** | --- | | | | |
| Pm | .08 | -.02 | .29 | .20 | .28 | .24 | .35* | --- | | | |
| Pv | .23 | .41** | .03 | .03 | -.03 | .11 | .05 | .41** | --- | | |
| SS | -.06 | -.52** | .20 | .07 | .23 | .12 | .31 | .36* | -.24 | --- | |

AAQ .62** .27 .63** .61** .71** .64** .46** .28 .11 .29* ---

Note: DERS: Clar = Clarity, Aware = Awareness, Imp = Impulsivity, Goal = Goals, Strat = Strategies, NA = Nonacceptance; UPPS: U = Urgency, Pm = Premeditation, Pv = Perseverance, SS = Sensation Seeking; AAQ = AAQ=II.

Note: ** indicates $p < .01$; * indicates $.01 < p < .05$.

Finally, as this was the first use of the borderline symptomatology assessment instrument created for the clinic, normative data are reported below in Table 3.

Table 3

Normative Data for Borderline Symptom Measure

| Borderline Symptom | Mean and Standard Deviation | Range |
|------------------------|--------------------------------|-------|
| <hr/> | | |
| Suicidal Ideation | .81 (1.95) | 0-10 |
| Impulsive Behaviors | 1.01 (2.27) | 0-15 |
| Dissociative Episodes | .41 (1.25) | 0-10 |
| Unstable Relationships | 2.02 (1.97) | 0-6 |
| Fear of Abandonment | 3.39 (1.71) | 0-6 |
| Unstable Identity | 1.79 (1.87) | 0-6 |
| Instable Mood | 2.39 (1.85) | 0-6 |
| Uncontrollable Anger | 1.79 (1.75) | 0-6 |
| Emptiness | 2.30 (1.85) | 0-6 |

| | | |
|-----------------|--------------|------|
| Paranoia | .90 (1.40) | 0-6 |
| Frequency total | 2.46 (4.69) | 0-29 |
| Likert Total | 14.58 (8.20) | 0-40 |

Change over Time in Borderline Symptoms

In order to address change in borderline symptoms across each individual's time in the study, paired samples t-tests were conducted comparing symptom assessment from initial assessment to final assessment received. Results are reported below in Table 4.

Table 4

Initial and Final Borderline Symptoms

| Symptom | Initial | Final |
|------------------------|-------------|--------------------------|
| Suicidal Ideation | 1.56 (2.71) | .85 (2.43) [‡] |
| Impulsive Behaviors | 1.02 (3.04) | .83 (1.85)* |
| Dissociative Episodes | .80 (1.98) | .28 (.68) |
| Unstable Relationships | 2.61 (2.00) | 2.09 (2.14) |
| Fear of Abandonment | 3.85 (1.75) | 3.30 (1.81) [‡] |
| Instability of Mood | 3.00 (1.85) | 2.48 (2.02) |
| Uncontrollable Anger | 2.36 (1.87) | 1.97 (1.84) |
| Unsure of Identity | 2.21 (2.16) | 1.45 (1.91)* |

| | | |
|-----------------|---------------|--------------|
| Emptiness | 2.48 (2.09) | 2.36 (2.00) |
| Paranoia | 1.50 (1.73) | .78 (1.47)* |
| Frequency Total | 4.24 (7.11) | 1.95 (4.04)* |
| Likert Total | 17.32 (10.35) | 14.55 (9.66) |

Note: Standard Deviations in parentheses.

Note: * indicates significant difference (t-test); $.01 < p < .05$; † indicates $.1 < p < .05$.

Thus, Hypothesis 2 regarding the reduction of impulsive behaviors was supported, such that impulsive behaviors decreased over time in DBT. Hypothesis 5 was partially supported, such that unstable identity and paranoia decreased over time. Hypotheses 1, 3 and 4 regarding suicidal ideation, relationship disturbance, and mood were not supported in this manner. Suicidal ideation and fear of abandonment approached significance in the downward direction over time in DBT. Unstable relationships, emptiness, anger, and instable mood did not change from initial assessment point to final assessment point. Overall, the omnibus index of suicidal behaviors, impulsive behaviors, and dissociative episodes decreased significantly over time.

Relation between Borderline Symptom Ratings and Emotion Regulation, Impulsivity, and Experiential Avoidance

In order to address the hypotheses related to the relationships between emotion regulation, impulsivity, and experiential avoidance and BPD symptoms, correlations of each scale and set of symptoms were calculated. Results are reported below in Tables 5 and 6.

Table 5

Correlations between DERS and Borderline Symptoms

| | Total | Clarity | Aware | Impulse | Goals | Strat | NA |
|----------|-------|------------------|-------|---------|-------|------------------|-------|
| SI | .36* | .05 | .09 | .44** | .47** | .48** | .15 |
| Imp Bx | .35* | .30 [†] | .10 | .32* | .37* | .36* | .24 |
| Dissoc | .18 | .01 | -.10 | .34* | .33* | .28 [†] | .00 |
| Un Rel | .52** | .25 | .01 | .56** | .50** | .56** | .48** |
| Aband | .23 | .12 | -.21 | .22 | .34* | .30 [†] | .24 |
| Mood | .35* | .15 | -.13 | .43** | .42** | .46** | .26 |
| Anger | .35* | .16 | -.04 | .43** | .38* | .42** | .21 |
| Un ID | .08 | .07 | -.11 | .13 | .23 | .08 | .01 |
| Empty | .31* | .25 | .14 | .29 | .23 | .22 | .37* |
| Paranoia | .24 | .19 | .08 | .26 | .26 | .26 | .10 |

Note: DERS: Clar = Clarity, Aware = Awareness, Imp = Impulsivity, Goal = Goals, Strat = Strategies, NA = Nonacceptance; BPD symptoms: SI = Suicidal Ideation, Imp Bx = Impulsive Behaviors, Dissoc = Dissociation, Un Rel = Unstable Relationships, Aband = Fear of Abandonment, Mood = Instable Mood, Anger = Uncontrollable Anger, Un ID = Unstable Identity, Empty = Chronic Emptiness.

Note: ** indicates $p < .01$; * indicates $.01 < p < .05$; [†] indicates $.1 < p < .05$.

Thus, on the whole, Goals, Impulsivity and Strategies were found to be positively correlated with BPD symptoms: in particular, suicidal ideation, impulsive behaviors, dissociative episodes, unstable relationships, unstable mood, and anger. Recall that in Table 2, Strategies was strongly correlated with both Impulsivity and Goals. Nonacceptance was also positively correlated with unstable relationships and emptiness.

Emotion regulation deficits were uncorrelated with unstable identity and paranoia.

Clarity and Awareness were not found to be correlated with any BPD symptoms. Thus, Hypothesis 6 is partially supported, as these data suggest that specific emotion regulation deficits have unique relationships to BPD symptoms.

Table 6

Correlations of UPPS and AAQ-II with Borderline Symptoms

| | UPPS | Urgency | Premed | Persev | SS | AAQ-II |
|----------|------------------|------------------|------------------|--------|------|--------|
| SI | .20 | .31 [‡] | .32* | -.12 | .03 | .23 |
| Imp Bx | .31 [‡] | .35* | .10 | -.03 | .32* | .43** |
| Dissoc | .05 | .29 [‡] | .18 | -.24 | -.02 | .16 |
| Un Rel | .23 | .43** | .20 | -.16 | .16 | .57** |
| Aband | .36* | .28 | .36* | -.04 | .36* | .46** |
| Mood | .32 [‡] | .43** | .26 | -.14 | .27 | .35* |
| Anger | .38* | .45** | .23 | -.09 | .34* | .34* |
| Un ID | .24 | .17 | .40** | .09 | .04 | .18 |
| Empty | .26 | .18 | .42** | .05 | .09 | .37* |
| Paranoia | .25 | .27 [‡] | .32 [‡] | .16 | .00 | .35* |

Note: UPPS: UPPS = Total, Premed = Lack of Premeditation, Persev = Lack of Perseveration, SS = Sensation Seeking; BPD symptoms: SI = Suicidal Ideation, Imp Bx = Impulsive Behaviors, Dissoc = Dissociation, Un Rel = Unstable Relationships, Aband = Fear of Abandonment, Mood = Instable Mood, Anger = Uncontrollable Anger, Un ID = Unstable Identity, Empty = Chronic Emptiness.

Note: ** indicates $p < .01$; * indicates $.01 < p < .05$; ‡ indicates $.1 < p < .05$.

Hypothesis 6 suggesting that impulsivity and experiential avoidance tendencies would differentially predict borderline symptoms was supported. Impulsive behavior and uncontrollable anger were positively correlated with Urgency, Sensation Seeking, and experiential avoidance. Unstable relationships and instable mood were positively correlated with Urgency and experiential avoidance. Fear of abandonment was positively correlated with lack of Premeditation, Sensation Seeking, and experiential avoidance. Unstable identity and emptiness were also positively related to lack of Premeditation. Paranoia was positively correlated with experiential avoidance. Overall, Urgency, Sensation Seeking, and experiential avoidance held the clearest relationships to BPD symptoms. Contrary to expectations, lack of Premeditation was related to some BPD symptoms. Lack of Perseverance was shown to be unrelated to BPD symptoms in this sample.

Moderation of Borderline Personality Disorder Symptoms by Emotion Regulation, Impulsivity, and Experiential Avoidance

Data Analysis Plan

In order to address the impact of initial self-rated difficulties in emotion regulation, impulsivity, and experiential avoidance on final reported BPD symptoms, a series of regressions were run that accounted for time in study and initial symptom assessment. Thus, the data were limited to those who had multiple BPD symptom assessments as well as intake data including DERS, UPPS, and AAQ-II scores ($N=30$). For all regressions, at the first step, time in study in months was entered ($M=5.97$, $SD=3.94$; range from 2-14) along with initial behavioral rating, in order to control for time in study and provide a comparison from baseline level of intensity for each symptom. In order to test for the impact of emotion regulation variables as moderators

on behavioral assessments, at the second step, total DERS scores were entered to assess for their influence on final BPD symptoms when controlling for initial BPD symptoms. In order to address the unique contributions of specific subscales of the DERS, a second set of regressions were run substituting global DERS scores with Clarity, Strategies, Goals, Impulsivity, and Nonacceptance from the DERS. In this manner, hypotheses addressing moderation could be tested.

Similarly, in order to test for the impact of impulsivity on the final assessment of BPD symptoms, at the second step, UPPS total scores were entered. Then, in order to address the unique contribution of individual subscales of the UPPS, all four subscales of the UPPS were entered. Thus, hypotheses addressing moderation of borderline symptoms by impulsive tendencies were tested.

In order to test for the impact of experiential avoidance on final behavioral assessments, at the second step, AAQ-II scores were entered. As with emotion regulation and impulsivity, this allowed for the testing of hypotheses regarding moderation of BPD symptoms by experiential avoidance.

Finally, in order to test for the relative contribution of emotion regulation, impulsivity, and experiential avoidance on BPD symptoms, with respect to time of assessment, a final set of regressions was run. Again, in the first step, time in study and initial rating for the BPD target dependent variable in question were entered. In the second step, DERS, UPPS, and AAQ-II scores were entered. Results for all regressions are reported below by target BPD dependent variable.

Omnibus Ratings of BPD Symptoms

In order to address overall moderation of BPD symptoms over time by the proposed set of moderators, the above-described series of regressions was run with an omnibus rating of BPD suicidal, self-damaging behaviors and dissociation. Examining total DERS scores, only initial BPD self-damaging symptoms were predictive of final ratings ($R^2=.408$; $t=2.251$, $p=.035$, $\beta=.331$). With the series of regressions examining individual DERS scales, no variable was significant ($R^2=.299$). For global impulsivity as indicated by total UPPS scores, again, only initial BPD suicidal and self-damaging behaviors was a significant predictor ($R^2=.311$; $t=2.556$, $p=.019$, $\beta=.470$). There was evidence to suggest that the model with individual UPPS subscales was not a good fit for the data. AAQ-II scores also did not impact final BPD suicidal and self-damaging behaviors after controlling for initial behavior counts ($R^2=.232$; $t=2.489$, $p=.021$, $\beta=.475$). Finally, considering DERS, UPPS, and AAQ-II scores simultaneously, no variable in the regression reached significance. Overall, greater frequency of suicidal and self-damaging behaviors in the beginning was predictive of greater frequency of such ratings at the end of the study.

A second set of regressions examined moderation of overall BPD Likert-rated items (addressing relationship, identity, mood, and paranoia symptoms). First of all, total DERS scores did impact final omnibus Likert symptom ratings, as well as time in the study ($R^2=.528$; $t=2.533$, $p=.019$, $\beta=.370$; $t=-3.869$, $p=.001$, $\beta=-.535$; respectively). Longer time in study was associated with lower final ratings of BPD symptoms. However, higher initial DERS scores was predictive of higher final BPD symptom ratings, when controlling for time in study. Considering individual DERS subscales, time

in study as well as Strategies scores predicted final omnibus BPD symptom ratings ($R^2=.632$; $t=-2.513$, $p=.022$, $\beta=-.355$; $t=-2.460$, $p=.024$, $\beta=-.720$). Thus, longer time in study and higher initial perceptions that one has limited affect regulation skills predicted the lowest final ratings of BPD symptoms overall. UPPS total scores did not influence final BPD symptom ratings, over and above time in study ($R^2=.405$; $t=-3.406$, $p=.003$, $\beta=-.562$). UPPS subscales also did not influence final BPD symptoms beyond time in study ($R^2=.393$; $t=-3.529$, $p=.003$, $\beta=-.601$). Experiential avoidance did significantly influence final BPD symptomatology, as did time in study ($R^2=.497$; $t=2.157$, $p=.042$, $\beta=.360$; $t=-3.809$, $p=.001$, $\beta=-.543$). Higher initial experiential avoidance predicted higher final ratings of BPD symptoms overall, while longer time in the study predicted lower symptom ratings. Finally, considering DERS, UPPS, and AAQ-II scores simultaneously, only time in study was significant ($R^2=.472$; $t=-3.407$, $p=.003$, $\beta=-.532$). Taken together, those that benefited most from treatment were those who stayed in the study longer, had higher initial perceptions that they had limited affect regulation skills, but lower global ratings of emotion regulation difficulties and experiential avoidance.

Suicidal Thoughts and Self-damaging Behaviors

For suicidal ideation, in the regression equation considering only emotion regulation ($R^2=.408$), DERS total scores did not influence final suicidal ideation over and above initial suicidal ideation ($t=3.66$, $p=.001$, $\beta=.605$). This indicated that higher initial suicidal ideation predicted higher final suicidal ideation. In other words, those who had higher suicidal ideation at the start of treatment generally continued to have suicidal thoughts at the final observation in the study. When considering all subscales of the DERS ($R^2=.369$), no emotion regulation variable or interaction reached significance after

controlling for initial suicidal ideation ($t=2.472, p=.023, \beta=.530$). Thus, the data did not support Hypotheses 7 and 8. For impulsive tendencies, again, UPPS scores did not significantly influence final suicidal ideation when controlling for initial suicidal ideation ($R^2=.486; t=3.263, p=.004, \beta=.514$), not supporting Hypothesis 9. Again, initial suicidal ideation was positively predictive of final suicidal ideation. Considering UPPS subscales ($R^2=.567$), lack of Perseverance was significant in predicting final suicidal ideation ($t=2.955, p=.009, \beta=.590$) when controlling for initial suicidal ideation as well as time in study ($t=3.783, p=.001, \beta=.785; t=-2.157, p=.046, \beta=-.306$, respectively). Again, suicidal ideation at initial assessment was positively predictive of final suicidal ideation. Longer time in study was associated with lower final suicidal ideation in this model. Lack of perseverance, or having difficulty with task completion, was also associated with higher final suicidal ideation when controlling for initial suicidal ideation. However, as this particular subscale was not expected to be related to suicidal ideation, these results are surprising and contradict Hypothesis 10. These data suggest that the group most likely to have difficulty with suicidal ideation at final assessment were those who had difficulty completing tasks and have initial difficulty with suicidal ideation. For experiential avoidance, the amount of variance accounted for suggested that the model was appropriate ($R^2=.393$), although AAQ-II did not influence final suicidal ideation after controlling for initial suicidal ideation ($t=4.032, p=.001, \beta=.664$), not supporting Hypothesis 11. Finally, in the full model accounting for emotion regulation, impulsivity, and experiential avoidance, a significant amount of variance was accounted for ($R^2=.433$). In this model, no hypothesized moderating variable was significant in

predicting suicidal ideation beyond initial suicidal ideation ($t=2.605$, $p=.018$, $\beta=.480$).

Thus, Hypothesis 12 was not supported.

Ultimately, global indicators of emotion regulation, impulsivity, and experiential avoidance did not moderate suicidal ideation over time in DBT. Overall, higher initial suicidal ideation tended to predict higher final suicidal ideation. Specific subscales of the UPPS, but not the DERS, help clarify the nature of this relationship. Lack of Perseverance was related to suicidal ideation from initial to final assessment, such that lack of Perseverance was a barrier to lower final suicidal ideation.

For impulsive behaviors, considering emotion regulation in isolation, the DERS scores did not moderate outcome, although initial impulsive behaviors were positively predicted of final impulsive behaviors ($R^2=.593$; $t=5.74$, $p<.001$, $\beta=.765$). Considering all subscales of the DERS, no subscale moderated impulsive behaviors beyond initial impulsive behaviors ($t=6.019$, $p<.001$, $\beta=.857$). In this model, a significant amount of the variance was accounted for ($R^2=.620$). For impulsive tendencies as measured by the total UPPS scores, total UPPS scores did not moderate outcome after controlling for initial impulsive behaviors ($R^2=.624$; $t=6.041$, $p<.001$, $\beta=.793$). Examining specific impulsive tendencies as measured by the UPPS subscales ($R^2=.625$), again, no subscale was significant beyond initial impulsive behaviors ($t=5.612$, $p<.001$, $\beta=.733$). For experiential avoidance ($R^2=.587$), AAQ-II scores did not predict final impulsive behaviors beyond initial impulsive behaviors ($t=5.876$, $p<.001$, $\beta=.800$). This indicated that greater initial impulsive behaviors tended to predict greater final impulsive behaviors. Finally, considering emotion regulation, impulsivity, and experiential avoidance simultaneously ($R^2=.586$), neither the predictor variables nor their interactions

were significant in predicting final impulsive behaviors when considering initial impulsive behaviors ($t=5.555$, $p<.001$, $\beta=.820$).

Overall, this does not support hypotheses 8-12. In this sample, those who indicated the greatest final impulsive behaviors were those who entered treatment with the most final impulsive behaviors.

Dissociation

For dissociative episodes, in the model considering only emotion regulation total scores, the data suggested that the model was inadequate. For global impulsive tendencies ($R^2=.343$), the total UPPS scores were not significant when controlling for initial dissociation ($t=3.130$, $p=.006$, $\beta=.551$). For specific impulsive tendencies, specific emotion regulation tendencies, experiential avoidance, as well as the full model, there was evidence to suggest the models were not appropriate.

Thus, Hypotheses 13, 14, and 16-18 were not tested due to model inadequacies. Hypothesis 15 was not supported, as UPPS scores had no bearing on final dissociation when controlling for initial dissociation. Higher initial dissociation was associated with higher dissociation at the last observation.

Relationship Variables

For unstable relationships, the regression models for emotion regulation, impulsive tendencies, and experiential avoidance were not supported by the data. However, considering all three constructs simultaneously, UPPS scores were related to final unstable relationship ratings ($R^2=.165$; $t=-2.424$, $p=.027$, $\beta=-.552$), although initial unstable relationships did not reach significance in this model. For those indicating high initial UPPS scores, lower final unstable relationship ratings were reported. Notably, a

small amount of variance was accounted for in this instance, and as such, the findings were interpreted with caution.

For fear of abandonment, a modest portion of the variance was accounted for considering only global emotion regulation ($R^2=.208$). No variable entered in this model reached significance. Examining individual subscales of the DERS, there was evidence to suggest the model was inappropriate. For global impulsive tendencies as indicated by total UPPS scores, UPPS scores were significant in predicting final fear of abandonment ($R^2=.373$; $t=2.262$, $p=.305$, $\beta=.469$). In this case, higher initial impulsive tendencies were associated with higher final fears of abandonment. Examining specific subscales of impulsivity, however, no variables entered into the regression were significant ($R^2=.299$). In the model considering only experiential avoidance, no variable reached significance ($R^2=.213$). For the full model, ($R^2=.296$), when controlling for all other moderators, no variable reached significance.

Taken together, the relationship variable regressions do not support Hypotheses 13, 14, 16, and 17. Hypothesis 15 was partially supported, such that higher baseline impulsivity predicted greater difficulty with fears of abandonment at the final observation. Hypothesis 18 regarding moderation of unstable relationships by emotion regulation, impulsive tendencies, and experiential avoidance was partially supported in that impulsivity moderated unstable relationships when controlling for emotion regulation, experiential avoidance, and initial unstable relationships.

Affect Dysregulation Symptoms

For unstable mood, in the model with global emotion regulation alone ($R^2=.264$), no hypothesized variables reached significance. Considering all subscales of the DERS,

again, no variable reached significance ($R^2=.261$). For the model with global impulsive tendencies, only initial unstable mood ratings predicted final unstable mood ratings ($R^2=.241$; $t=2.490$, $p=.022$, $\beta=.498$). This indicated that higher initial mood instability was related to final mood instability. For the model with specific impulsive tendencies, the model was not a good fit for the data. Considering only experiential avoidance ($R^2=.256$), no variable reached significance. In the full model, analysis of the data suggested the model was not appropriate. Thus, overall, the current data set revealed no moderators for instable mood by emotion regulation, impulsivity, or experiential avoidance. When considering impulsivity alone, initial unstable mood ratings predicted final unstable mood ratings.

For uncontrollable anger, in the model considering only emotion regulation total scores ($R^2=.575$), DERS scores did not moderate anger, although time in study was significant when controlling for initial anger ($t=-3.560$, $p=.002$, $\beta=-.447$; $t=4.110$, $p<.001$, $\beta=.599$). Thus, a longer time in the study was associated with lower anger ratings at the final assessment. Examining DERS subscales to search for unique prediction by DERS subscales, time and initial anger ratings were significant ($R^2=.577$; $t=-3.600$, $p=.001$, $\beta=-.452$; $t=5.180$, $p<.001$, $\beta=.650$, respectively), but no subscale of the DERS reached significance. For impulsive tendencies, total UPPS scores did not moderate anger, although time was significant, as well as initial anger ratings ($R^2=.638$, $t=-3.285$, $p=.004$, $\beta=-.415$; $t=5.331$, $p<.001$, $\beta=.731$, respectively). The same pattern observed with emotion regulation was observed here as well. While overall, higher initial anger ratings predicted higher final observations of anger, longer time in treatment was associated with lower final anger ratings. Considering individual UPPS subscales ($R^2=.578$), length of

time in study predicted final anger ratings as well as initial anger ratings ($t=-2.898, p=.01, \beta=-.404; t=4.905, p<.001, \beta=.727$, respectively). For experiential avoidance alone ($R^2=.573$), experiential avoidance was not significant in predicting final anger ratings, over and above time in the study and initial anger ratings ($t=-3.517, p=.002, \beta=-.451; t=4.709, p<.001, \beta=.645$, respectively). Considering the full model ($R^2=.591$), again, only time and initial anger ratings reached significance when controlling for all three proposed moderators ($t=-3.143, p=.006, \beta=-.431; t=4.339, p<.001, \beta=.702$, respectively).

Global and specific emotion regulation, impulsivity and experiential avoidance variables were not useful in predicting final ratings of unstable mood or uncontrollable anger, thus not supporting hypotheses 13-18. In all regression models, length of time in study was negatively predictive of final anger ratings when controlling for initial anger ratings, suggesting that time is important for lower anger.

Identity and Cognitive Disturbance

For unstable identity, in the model considering emotion regulation by itself ($R^2=.365$), only initial unstable identity ratings predicted final unstable identity ($t=3.139, p=.005, \beta=.498$). Examining subscales of the DERS to account for unique contributions of subscales ($R^2=.677$), Clarity and Strategies were significant ($t=3.856, p=.001, \beta=.586; t=-2.327, p=.031, \beta=-.668$, respectively), when controlling for initial unstable identity ratings ($t=2.536, p=.020, \beta=.337$). Thus, while higher ratings of unstable identity at the beginning of treatment tended to predict higher ratings of unstable identity at the final observation, specific deficits of emotion regulation impacted this relationship. For instance, higher difficulties with emotional clarity in the beginning of treatment were associated with greater difficulties with identity stability at the end of treatment.

Conversely, having fewer strategies for effective emotion regulation in the beginning of treatment was associated with lower final unstable identity ratings. For global impulsive tendencies ($R^2=.351$), both time and initial rating predicted final unstable identity ($t=-2.429, p=.025, \beta=-.410$; $t=2.404, p=.026, \beta=.488$, respectively). However, considering UPPS subscales ($R^2=.543$), both lack of Premeditation and lack of Perseverance predicted final ratings of unstable identity ($t=-2.217, p=.048, \beta=-.522$; $t=2.502, p=.023, \beta=.458$, respectively), over and above time in study and initial unstable identity ratings ($t=-2.619, p=.018, \beta=-.381$; $t=3.869, p=.001, \beta=.835$, respectively). Thus, those with initial difficulties thinking before acting had lower final ratings of unstable identity, when controlling for initial ratings of unstable identity, suggesting that those individuals benefited more in treatment. Conversely, initial difficulty with task persistence was associated with final difficulty with unstable identity. For the model considering experiential avoidance alone ($R^2=.324$), experiential avoidance did not predict ratings of unstable identity beyond that accounted for by initial ratings ($t=2.765, p=.011, \beta=.475$). In the full model ($R^2=.500$), DERS scores were related to final ratings of unstable identity ($t=2.394, p=.028, \beta=.590$), as well as time in study and initial ratings ($t=-2.710, p=.015, \beta=-.411$; $t=2.219, p=.040, \beta=.417$, respectively). This indicated that higher initial DERS ratings were associated with higher final unstable identity ratings.

For emptiness, the only model that was appropriate was the model involving global DERS scores. In this model ($R^2=.206$), only DERS scores predicted final emptiness ratings ($t=2.164, p=.041, \beta=.397$). Thus, higher initial emotion regulation difficulties predicted higher final emptiness ratings.

For the data regarding self-regulation symptoms, Hypothesis 13 was contradicted, as higher DERS predicted higher emptiness. Hypotheses 14 and 16 were partially supported, as specific emotion regulation deficits helped predict final unstable identity. Hypotheses 15 and 17 were not supported. Hypothesis 18 was also contradicted, as DERS scores predicted higher unstable identity at the final assessment when considering impulsivity and experiential avoidance as well.

Paranoia

Finally, for paranoia, in the model considering emotion regulation alone, a significant amount of the variance was accounted for ($R^2=.248$). In this model, only initial paranoia rating was significant ($t=2.773$, $p=.011$, $\beta=.489$). Thus, higher initial ratings of paranoia tended to predict higher final paranoia. Examining individual subscales of the DERS ($R^2=.435$), both Goals and Strategies reached significance ($t=2.233$, $p=.038$, $\beta=.918$; $t=-2.995$, $p=.007$, $\beta=-1.259$, respectively). Thus, having difficulty maintaining goal-directed behavior when distressed was associated with difficulty with paranoia at the final observation. However, having limited strategies for affect regulation at initial assessment was associated with the lowest final paranoia ratings. For global impulsive tendencies ($R^2=.424$), UPPS total scores did not moderate paranoia, with time in study significantly predicting final paranoia ($t=-2.380$, $p=.027$, $\beta=-.380$). Longer time in treatment was associated with lower paranoia ratings. In looking at individual UPPS subscales ($R^2=.634$), time in study as well as lack of Perseverance predicted final paranoia ($t=-3.511$, $p=.003$, $\beta=-.459$; $t=2.814$, $p=.012$, $\beta=.430$, respectively). Greater difficulty with task persistence in the beginning of treatment was associated with final difficulty with paranoia. For the experiential avoidance model

($R^2=.256$), AAQ-II scores did not predict final paranoia above and beyond initial rating of paranoia ($t=2.566$, $p=.017$, $\beta=.462$). In the full model ($R^2=.349$), no main effects or interactions were significant, although time in study was ($t=-2.211$, $p=.041$, $\beta=-.384$).

Overall, Hypotheses 14 was partially supported, as Strategies was expected to be related to paranoia, but Goals scores were not. Hypothesis 16 was also contradicted, as lack of Perseverance was not expected to be related to paranoia. Hypotheses 13, 15, 17, and 18 were not supported. This suggests that specific deficits in emotion regulation and impulsivity are most useful in predicting paranoia at the end of treatment. In addition, longer time in treatment tended to predict lower final paranoia. A summary of all regressions is represented in Table 7 below.

Table 7

Summary of Regression Results

| | DERS | UPPS | AAQ-II | All |
|------------------------------|-----------------------------|-------------------------------------|---------------------|-------------------|
| Omnibus BPD Symptom - freq | <i>Initial</i> ; Poor Model | <i>Initial</i> ; Poor Model | <i>Initial</i> | NS |
| Omnibus BPD symptom – Likert | Time, DERS; Strat | Time | Time, AAQ-II | Time |
| Suicidal Ideation | <i>Initial SI</i> | <i>Initial SI</i> ; Time, Pv | <i>Initial SI</i> | <i>Initial SI</i> |
| Impulsive Bx | <i>Initial IB</i> | <i>Initial IB</i> | <i>Initial IB</i> | <i>Initial IB</i> |
| Dissociation | Poor Model | <i>Initial Dissoc/</i> Poor Model | Poor Model | Poor Model |

| | | | | |
|-----------------|--|---------------------------------|---------------------------|-------------------------------|
| Unstable Rships | Poor model | Poor Model | Poor model | UPPS |
| Fear of Abandon | NS | <i>UPPS</i> | NS | NS |
| Unstable Mood | NS | <i>Initial Mood</i> | NS | NS |
| Anger | Time/Initial Anger | Time/Initial Anger | Time/Initial Anger | Time/Initial Anger |
| Unstable ID | <i>Initial ID; Clar, Strat</i> | Time, Initial ID; Pm, Pv | <i>Initial ID</i> | Time, Initial ID; DERS |
| Emptiness | <i>DERS</i> | Poor model | Poor model | Poor model |
| Paranoia | <i>Initial PN; Goals, Strat</i> | Time; Pv | <i>Initial PN</i> | Time |

Note: DERS: Clar = Clarity, Aware = Awareness, Imp = Impulsivity, Goal = Goals, Strat = Strategies, NA = Nonacceptance; UPPS: UPPS = Total, Premed = Lack of Premeditation, Persev = Lack of Perseveration, SS = Sensation Seeking; BPD symptoms: SI = Suicidal Ideation, Imp Bx = Impulsive Behaviors, Dissoc = Dissociation, Un Rel = Unstable Relationships, Aband = Fear of Abandonment, Mood = Instable Mood, Anger = Uncontrollable Anger, Un ID = Unstable Identity, Empty = Chronic Emptiness; NS = Not significant.

Note: **Bold** indicates negative relationship; *Italics* indicates positive relationship.

CHAPTER 4

DISCUSSION

Interpretation and Implication of Results by BPD Symptom

Overall, the data in this study suggest that emotion regulation, impulsivity tendencies and experiential avoidance do have unique relationships to specific BPD symptoms. Such data contribute to the growing literature on understanding who is helped by DBT, and have implications for how the treatment works. Overall, BPD self-damaging behaviors decreased over time in DBT, but were not moderated by any proposed moderator. Conversely, global Likert-rated BPD symptoms did not decrease over time on the whole. However, longer time in study was associated with reduction of those symptoms, and they were moderated by emotion regulation and experiential avoidance. Global ratings of emotion regulation and experiential avoidance were associated with higher ratings of BPD symptoms, indicating that those with these deficits struggle the most over time in treatment. However, greater initial perceptions that one had limited means of regulating affect were associated with lower final symptom ratings, indicated that they benefited the most – or learned to compensate for those deficits – over time in treatment.

Suicidal Ideation and Impulsive Behaviors

Suicidal ideation approached a significant reduction from initial to final observation. However, in the series of regressions regarding suicidal ideation, it

appeared that those who struggled with suicidal ideation at the final observation were those who initially struggled with such thoughts. Longer time in treatment was associated with lower suicidal ideation, when examining impulsive tendencies. This makes sense, considering the long-standing, habitual nature of such thinking (e.g., Brodsky et al., 1997; Linehan, 1993). There was also evidence that non-suicidal, self-damaging impulsive behaviors did decrease over time in treatment. This is not unexpected, given DBT's effective adaptation in other non-suicidal, impulsive samples, such as those with substance use disorders (Harned et al., 2008; Linehan et al., 1999, 2002) and eating disorders (Hill, Craighead, & Safer, 2011; Kroger et al., 2010; and Telch, Agras & Linehan, 2001). Moreover, this data corroborates and extends findings in inpatient (Bernheim et al., 2011) and partial hospitalization samples (Yen et al., 2009) that have demonstrated overall reductions in impulsivity in DBT.

Correlations of DERS scores and suicidal ideation and impulsivity followed a similar pattern, suggesting that suicidal ideation and impulsive behaviors have similar emotion regulation functions for those in DBT. Specifically, suicidal ideation and impulsivity were associated with total DERS scores, Impulsivity, Goals, and Strategies. This is interpreted to mean that the use of self-damaging behaviors for those in DBT is associated with limited behavioral flexibility and significant mood-dependent behavior in times of distress. Having specific, more adaptive skills to use while in distress, as is the bulk of Distress Tolerance teaching, may be most helpful such individuals. Contrary to expectations, nonacceptance scores were not correlated with suicidal ideation or impulsive behaviors. Thus, those who were more nonaccepting of distress were no more likely to engage in suicidal thinking or impulsive behaviors than those more accepting of

distress. Again, contrary to the hypotheses, regression analyses did not show a relationship between emotion regulation and either final suicidal ideation or impulsive behaviors, when controlling for initial behavior ratings. Axelrod and colleagues (2011) demonstrated that in a DBT-S sample, increased emotion regulation skills were associated with decreases in substance use. This study did not show any individual differences in treatment based on initial emotion regulation deficits. However, this does not necessarily indicate that emotion regulation skills acquisition is not a mechanism of action for this particular behavior target.

Impulsivity and experiential avoidance were not related to suicidal ideation and impulsive behaviors in the same way. Lack of Premeditation was related to suicidal ideation, which makes sense given the common thought component for each item. Impulsive behaviors were related to Urgency, Sensation Seeking, and experiential avoidance. According to Farmer and Golden (2009), sensation-seeking motivation for impulsive behavior responds best to reducing the reinforcing value of such behaviors. It would be particularly difficult to do so in a DBT context, as impulsive behaviors engaged in by those with sensation seeking motivations may not be identified by those participants as behavioral targets in treatment. Moreover, Sensation Seeking is conceptually related to bipolar disorder. As diagnoses were not available in the current sample, little can be said as to the impact of mania/hypomania on impulsive behaviors in question. Yet it stands to reason that mania or hypomania could be at play in a subset of the sample. Overall, the pattern observed – in which impulsive behaviors are related to emotion regulation factors and experiential avoidance – is consistent with several extant theories

regarding the nature of impulsive behavior in BPD (e.g., Gratz, 2007; Selby & Joiner, 2009).

Lack of Perseverance, or difficulty with task persistence, was unexpectedly the only variable to moderate final suicidal ideation, after controlling for initial suicidal ideation. Greater initial difficulty with task persistence was predictive of difficulty with suicidal ideation at the final assessment, controlling for initial suicidal ideation. If a person has difficulty with task persistence, he or she might have more opportunities to feel like a failure or engage in other negative self-evaluative processes. This sense of failure, if prolonged, is likely associated with feelings that one's life is not worth living. This supports extant research establishing the importance of impulsivity in evaluating and treating suicidal thoughts and behaviors (Klonsky & May, 2010). These data suggest that making meaningful progress toward long-term goals may lead to reduction of suicidal ideation in treatment. Had this particular sample included only those who had completed a full 12 months of DBT, or had more available data on personal goal progress, this relationship would be more telling. This suggests that clinicians would do well to attend to the underlying impulsivity and emotion regulation deficits in instances of suicidal ideation.

Dissociation

Overall, dissociation rates were relatively low in this sample. Those who initially indicated occasional dissociative episodes generally continued to endorse such episodes at the final assessment. A review of the literature on DBT has inconsistent results for dissociation in DBT, although this study lends support to those who did not show that dissociation decreased over time (Barnicot et al., 2012).

Compared to other target variables, dissociation did not have as many correlations with emotion regulation, impulsivity, and experiential avoidance. Only Impulse and Goals scores from the DERS were correlated with dissociative episodes. In addition to the low number of correlated trait variables, there was also no moderation by emotion regulation, impulsivity, or experiential avoidance. As dissociation in BPD is considered to be a transient, distress-related response, one would expect that those with dissociation would also struggle with mood-dependent behavior while distressed. Difficulty engaging in goal-directed behavior while in distress is likely a feature of dissociation itself. Therefore, it makes sense that high ratings of Goals initially are related with higher difficulty with dissociation at the end. Overall, these data appear to be more descriptive of the qualities of dissociation rather than dissociation as it exists in a DBT context.

Relationship Difficulties

Regarding BPD criteria related to relationships, fear of abandonment approached significant reduction in a paired sample t-test. It is not surprising that relationship variables did not show substantial improvement over time, as relationship symptoms are not often top-priority targets in DBT, given the frequent presence of safety concerns.

Unstable relationships tended to be more correlated with affect-specific constructs, whereas fears of abandonment were more related to impulsivity and experiential avoidance. Specifically, unstable relationship ratings were related to negative urgency, experiential avoidance, nonacceptance of emotional states, engaging in mood-dependent behavior when distressed, and possessing limited strategies for regulating affect. Thus, it appears that having mood regulation difficulties is related to the stability of relationships. Recall that Stepp and colleagues (2008) found evidence

supporting the notion that emotion regulation skill acquisition reduces relationship difficulty in DBT. While the data in the current study did not find evidence that individual differences in emotion regulation difficulty predict outcome in terms of relationship criteria, this does not preclude the possibility that such skills act as a mechanism of change. Difficulties with fears of abandonment were associated with experiential avoidance, global impulsivity, failure to think prior to action, and sensation seeking. In addition, controlling for the influence of time and initial fear of abandonment ratings, higher initial difficulty with impulsivity was associated with higher final fear of abandonment. Thus, those with greater impulsivity have a harder time in relationships in DBT. It is possible that impulsive, erratic behavior is burdensome to others. Such behaviors may be viewed as attractive or intriguing in initial phases of relationships, but may become a liability as relationships shift over time. Impulsive individuals may also struggle to understand the impact of their behavior on others, making regulation of such behavior even more difficult. Such findings are important at this time, as there is limited cognitive-behavioral data discussing how relationship-based concerns are addressed in BPD treatment.

Relationship criteria are particularly difficult to measure in a single item. Intense, unstable relationships, as well as fears of abandonment and rejection, are complex, and rely largely on characteristics inherent in individuals not participating in the assessment. Also, select individuals in DBT might be quite isolated and have little information on which to base this item. Without having this information, it is difficult to determine what impact emotion regulation, impulsivity, and experiential avoidance truly have on interpersonal relationships over time in DBT. Moreover, it stands to reason that other

symptoms of BPD – e.g., anger, instable mood, or chronic suicidal ideation – have more of an impact on significant relationships than self-rated underlying emotion regulation or impulsivity difficulties per se. Finally, Lenzenweger and colleague's (2012) findings across three treatments for BPD suggest that emotional and behavioral dyscontrol change at different rates than self- and relationship-related symptoms. This could explain the difficulty in using emotion regulation, impulsivity, and experiential avoidance to predict unstable relationships: especially in a single item.

Mood-Related BPD Symptoms

Mood-specific criterion had surprising results in this sample. For instance, individual mood and anger ratings did not change over time in t-tests. However, longer time in treatment was crucial for decreased difficulty with anger. It makes sense that anger would be more responsive to length of time in treatment, given the higher priority treatment of life-threatening, therapy-interfering, and quality-of-life interfering behaviors in DBT (Linehan, 1993). Notably, other studies have shown that anger expression as measured by a full scale found reduction in anger through DBT (Neacsiu et al., 2014). A review of DBT treatment studies overall found that results regarding anger have generally been inconsistent (Barnicot et al., 2012). Regardless of the generally crude measurement of anger in this sample, it is important for clinicians to know that they can expect anger to decrease over time in DBT.

As one might expect, both unstable mood and uncontrollable anger were correlated with the same emotion regulation, emotion regulation, and impulsivity tendencies: specifically, global DERS scores, difficulties engaging in goal-directed behavior, tendencies to engage in mood-congruent behavior, limited affect regulation

strategies, negative urgency, and experiential avoidance. However, no variable moderated either uncontrollable anger or unstable mood. This contradicts the expectations of treatment, given that the treatment is designed for those who have affect regulation difficulties (Linehan, 1993). This could be for a number of reasons, but is most likely related to the difficulty of capturing mood instability and uncontrollable anger with a single item. Difficulty with mood regulation more broadly provided more information on many different symptoms assessed in this study than self-rated mood instability itself.

Self Dysregulation

Multiple analyses indicated that self-rated unstable identity decreased over time in DBT. This makes intuitive sense, as a central component of DBT is working toward long-term goals in order to build a “life worth living” (Linehan, 1993), as one means of creating valued living and stabilizing a sense of self. One would expect this symptom might be more responsive to time, as long-term goals necessitate a longer time in treatment in order to be effective. Such findings are encouraging to clinicians and candidates for DBT. This sample did not demonstrate a decrease in the emptiness criterion over time in DBT.

Less is known in the current sample about the ways in which emotion regulation, impulsivity, and experiential avoidance might be related to self-regulation criteria. For example, emotion regulation and impulsivity were less correlated with unstable identity and emptiness than they were with other target BPD symptoms. Failure to think prior to action was related to both emptiness and unstable identity. This is consistent with logic,

in that making decisions in order to reach one's self-identified goals requires thought of the short- and long-term consequences of all action.

Regression analyses supported the notion that emotion dysregulation is important for predicting success or difficulty with self-regulation variables in DBT. Generally speaking, emotion dysregulation was predictive of self dysregulation in this sample. For instance, low emotional clarity was a vulnerability for identity instability over time in DBT, suggesting that understanding our emotions might provide some sense of self-understanding. By contrast, those who initially indicated difficulty with having strategies for affect regulation were helped most in terms of their unstable identities at the end of treatment, indicating that this treatment may have provided compensatory strategies for such individuals (Cronbach & Snow, 1977). This suggests a potential mechanism of action for this variable, as was demonstrated in Stepp and colleagues (2008), in which emotion regulation and mindfulness skill acquisition was associated with reductions in identity disturbance features of BPD. Oftentimes, those engaged in DBT come from environments that might have defined such individuals by their dysregulated behavior, as opposed to their own goals and self-identification (e.g., Linehan, 1993). Increasing affect regulation might promote increased regulation of one's own sense of self. Additionally, emptiness was correlated with nonacceptance of emotional states as well as experiential avoidance. Emotions can inform one's sense of self. As people reject their distress, they may reject important data for forming their own sense of self.

Although this ran contrary to hypotheses, failure to think prior to action as well as difficulty with task persistence influenced final observations of unstable identity, when controlling for initial observations. As with suicidal ideation, difficulty with task

persistence was a hindrance to lower unstable identity over time. This is interpreted to mean that success in goal pursuit in DBT, through identification of “life worth living” goals, is more difficult for those who enter treatment with trouble following through on goals. Perhaps by targeting task persistence more directly, one would have further opportunities for meeting goals, stabilizing a sense of self, and increasing self-efficacy overall.

Identity-related variables, particularly emptiness, may not be well explained by the proposed affective and behaviorally-based moderators proposed in this study, as they may change in different manners as suggested by Lenzenweger and colleagues (2012). This may be due to the nature of chronic emptiness, which is considered, by definition, to be a stable self-appraisal, whereas the moderator variables of interest are somewhat transient and distress-specific. Thus, the limitations of the measurement of these particular BPD criteria make drawing any conclusions, much less interpreting null results, difficult. Again, as with relationship variables, there is little extant cognitive-behavioral data to date that addresses the role of sense of self in DBT and BPD.

Paranoia

In the current sample, paranoia decreased significantly over time in DBT. Overall, paranoia was unrelated to emotion regulation deficits and impulsive tendencies, but moderately correlated with experiential avoidance. As paranoia is a unique symptom with a low base rate in this sample, these data are unsurprising.

Moderation models suggested that final paranoia was predicted by specific deficits in emotion regulation and impulsivity, but not experiential avoidance. Those indicating initial difficulty with task persistence and engaging in goal-directed behavior

when distressed were more likely to report paranoia at the final observation. This may be a reflection of the nature of paranoia, as it likely disrupts behavior overall. Paranoid beliefs are quite uncomfortable and likely related to problematic behaviors, particularly in a DBT sample. It makes sense that the behavioral dyscontrol inherent in impulsivity, as well as difficulty regulating affect, would predict difficulty managing this symptom. Conversely, those helped most with their paranoia were those who indicated difficulty flexibly regulating affect. Although this is an indirect effect, it suggests that those who enter DBT with self-described limited affect regulation capacity are better able to reduce their paranoid beliefs at the end of treatment than those who do not enter treatment acknowledging difficulty with affect regulation skills. In other words, they are able to compensate for their deficits (Cronbach & Snow, 1977).

Given the relatively low ratings of paranoia as compared to other symptoms, this set of results is interpreted with caution. A review of DBT studies to date showed contradictory findings with regard to the role of paranoia in treatment (Barnicot et al., 2012). This study suggests that it does decrease in treatment. Alternative models of BPD symptoms may be more illustrative in describing how and for whom paranoia is reduced in DBT. For instance, cognitive appraisals might be more useful in determining how paranoia changes over time in DBT.

Summary of Results by Moderating Variables

Emotion Regulation

As Linehan (1993) conceptualizes BPD, BPD is considered to be a disorder of emotion regulation above all else. Thus, DBT is designed to place emotion regulation skills as a central component of treatment. It is therefore not surprising that the current

study demonstrated strong relationships between BPD symptoms and emotion regulation difficulties, even more so than experiential avoidance. Overall, emotion regulation was related to suicidal ideation, impulsive behaviors, unstable relationships, unstable mood, and anger. In particular, emotion regulation difficulties related to behavior in times of distress – namely, Goals, Impulsivity, and Strategies – had the strongest relationships to BPD criteria overall. However, contrary to predictions, global emotion regulation deficits only moderated emptiness, and in the opposite direction predicted, so that those initially indicated elevated DERS scores had higher final ratings of emptiness, controlling for initial emptiness. Specific emotion regulation deficits were more strongly related to BPD symptoms over time. For instance, those initially indicating difficulty employing multiple effective emotion regulation strategies were helped the most in terms of their unstable identity and paranoia. This confirms that DBT is, in fact, helpful for those whom it was designed to treat, by allowing them to compensate for such perceived deficits. However, low emotional clarity and difficulty engaging in goal-directed behavior while distressed were predictive of continued difficulty with unstable identity and paranoia, respectively. This is consistent with the results found by Salsman & Linehan (2012), who found that Clarity, Goals, and Strategies had an indirect effect on BPD symptoms in undergraduates. Clinicians treating those with these specific vulnerabilities would do well to target such underlying deficits more systematically in treatment. DBT lends itself well to increasing strategies for affect regulation, making it not surprising that those initially indicating such difficulties benefit the most. Other studies have demonstrated that skills use endorsement on diary cards is predictive of reduction of target behaviors (Neacsiu, Rizvi, & Linehan. 2010; Stepp et al., 2008).

Taken together, there is converging evidence that suggests that those with initial deficits in emotion regulation skills are helped the most in treatment, and those who use more skills during treatment also benefit more greatly. On the other hand, accepting the significant amount of distress experienced by those in DBT may take longer to implement, and be less easy to identify as a moderator of change.

Impulsivity

Various theories have been posited linking impulsivity and BPD symptoms. The current findings further clarify this relationship. In this sample, global impulsivity was correlated with fear of abandonment and anger ratings. Negative urgency, or acting rashly while in distress, was related to impulsive behaviors, unstable relationships, and both mood criteria. Lack of Premeditation was related to fear of abandonment as well as both emptiness and unstable identity, and predicted lower final unstable identity. This suggests that, to some measure, DBT may be beneficial in helping individuals think before acting, with particular benefits in terms of self-identity. Lack of Perseverance, or task persistence in the face of difficulty, was often a hindrance to progress in treatment. This was true for paranoia, unstable identity, and suicidal ideation. Thus, more consistent addressing of task persistence through individual goals may be warranted for such individuals.

Overall, this set of findings is generally at odds with various studies implicating impulsivity as being important in predicting suicidal behavior, among other personality factors (e.g., Mehlum, 2009). Lynam et al. (2011) links the tendency to act rashly in the face of negative affect, or Negative Urgency, to BPD. The correlations observed in the current sample between Urgency and impulsive behaviors, suicidal ideation, dissociation,

and relationship variables suggests that impulsive behaviors likely serve some sort of affect regulatory function for those in DBT, and that a tendency to act rashly has implications for relationships. Urgency was not found to be a moderator, contrary to expectations. While it may be that individual differences in urgency have no bearing on treatment progress, it is also possible that related emotion regulation constructs simply explain mood-dependent behavior more accurately and comprehensively. As the study of impulsivity in clinical samples using the UPPS model is relatively new (Whiteside & Lynam, 2001), such findings bear replication.

Experiential Avoidance

Overall, experiential avoidance scores were highly intercorrelated with emotion regulation and impulsivity, suggesting common variance. AAQ-II scores were correlated with impulsive behaviors, relationship symptoms, mood symptoms, emptiness and paranoia, which is congruent with studies linking experiential avoidance to BPD (Chapman, Specht, & Cellucci, 2005; Neacsiu et al., 2014). In the current study, experiential avoidance was not found to be a moderator of any BPD symptom over time, when controlling for initial symptom level and time in treatment. This data is somewhat in contrast with the data reported by Neacsiu and colleagues (2014), which suggested that high experiential avoidance was related to less progress in treatment.

It is noteworthy that the majority of BPD symptoms had a stronger relationship with emotion regulation difficulties than they did experiential avoidance. This is in contrast with the data reported by Iverson and colleagues (2012), which found that experiential avoidance was related to BPD symptoms after controlling for emotion regulation. A key difference in methods could explain this distinction. Iverson and

colleagues conducted their analyses with the total DERS scores, and did not describe specific relationships between the subscales and BPD criteria (Iverson et al., 2012).

Gratz and Roemer (2004) designed the DERS as a multi-dimensional measure of emotion regulation. The current study pays particular attention to the distinctions between AAQ-II scores and DERS total scores as well as subscales. Examination of global scores suggest that global emotion regulation and experiential avoidance are related to different symptoms, while specific emotion regulation deficits give more fine-grained information on symptoms. While the findings reported here do not suggest that experiential avoidance is inconsequential in DBT, they do suggest that differences in emotion regulation difficulties are more illustrative in terms of understanding change in symptoms over time.

Limitations

As the design of the study was essentially an observation of data used for clinical purposes, the measures used were restricted to those used in treatment. Client perception of their symptoms in such an easy-to-administer manner has great clinical utility: especially in light of other diary card data available to clinicians. Unfortunately, this meant compromising research goals, as the measurements of BPD symptoms were limited to single items. Thus, it might be difficult to use such findings to compare this research to other studies that have more well-validated representations of BPD symptoms. In addition, inconsistencies in the receipt of such measures from clients made it difficult to draw more nuanced time-based comparisons, and place further constraints on the generalizability of results. It is worth noting that the rate of consent for the study

as well as the rate of the receipt of data is largely consistent with that reported in non-RCT studies, particularly those in outpatient settings.

Additionally, accurate diagnostic data are not available for this sample, given the standards in the practice. While this makes drawing conclusions of diagnostically challenging items such as impulsive behaviors difficult, this is a naturalistic study that likely reflects real-world variability in clients participating in DBT. The challenge of the presumed diagnostic heterogeneity is that it limits the conclusions that can be drawn by introducing a number of confounding variables, particularly for non-significant items.

Also, this sample had too few instances of suicide attempts, suicide threats, and self-harm reported to be able to test hypotheses related to these critical items. It is worth noting that follow-up studies to DBT have shown that the initial inclusion criterion for DBT RCTs had higher requirements for self-harming and suicidal behaviors than one might expect in a typical outpatient sample. Again, this reflects a strength of this study in that it demonstrates that DBT is effective for an emotionally dysregulated, but less acutely suicidal sample. Reasons for the low number of self-harm and suicide attempts could be encouraging, in that it could suggest that DBT is effective in keeping such behaviors at bay throughout treatment. However, it could also reflect a bias in the sample, such that individuals who are, in fact, engaging in those behaviors are either not electing to have their data in the sample or are not coming in for treatment at that time, since the items ask about the last week.

Finally, the relatively low sample size also limits the generalizability. Such a low sample size considerably inflates the risk of a Type I error, increasing the probability that rejected null hypotheses should have been accepted. While statistical methods reduce the

risk of this error, multiple hypothesis testing overall increases the risk. For instance, in the seventy-two regressions run in this sample, with the p-level set at .05, one would expect nearly four significant results based on chance alone. Thus, around four of the ten significant results found would be expected based on chance alone. Finding significant p-values between .01 and .001 minimizes the risk that such findings were based on chance. However, due to this risk, the above-described results must be interpreted with caution. Moreover, the low sample size leads the analyses to be underpowered, increasing the risk of a Type II error, indicating that perhaps some moderation might be observed if the sample size were increased. Thus, it is highly possible with such a small sample size that there may be characteristics unique to participants in this particular DBT program that might influence the data and not be observed elsewhere. This ultimately means that the results in this sample bear replication.

Future Directions

First and foremost, the current findings should be replicated in different clinics. Where possible, other studies examining moderators would do well to include well-validated symptom assessments as dependent variables. As self-report data over the last week may not be accurate, ecological momentary assessment would be useful in monitoring a more accurate estimate of symptom change over time. Interview data may also be useful in determining change in symptoms, as well as therapist ratings of such behaviors. Future studies should also examine emotion regulation, impulsivity, and experiential avoidance as potential mediators for treatment change.

Using local clinical data for research can address some of the criticisms of RCTs, in that the control seen in such studies limits the ecological validity of the treatments

studied. Using such data from a program evaluation perspective can be useful in terms of demonstrating local effectiveness. As greater numbers of group practices specializing in DBT become operational, such data could be used in further cross-clinic assessments in order to see whether or not the same types of relationships hold elsewhere. In any clinical setting where measures may be used for research purposes, it is important that the clinic have a well-thought out plan for implementation of such research so that it poses the least disruption to treatment implementation and the least burden on clinicians and clients.

In examining clinical data, client perception of change is truly important, given the role of self-efficacy in implementing future skills use over time in treatment. Adding simple items such as, “Which skills do you feel were most helpful?” may enhance the findings in this study, and be beneficial for future participants in DBT. The role of feedback to clients could also enhance implementation of treatment. Future studies would do well to monitor how feedback on assessments is given to clients in order to see what impact this might have on implementation of skills. Finally, given the rotation of modules in DBT, future researchers could examine the role of specific modules on specific behavioral targets.

Overall, the current study has important implications for effectiveness of DBT in the real world. As clinics continue to implement adherent DBT in outpatient, non-academic settings, they would do well to increase their participation in research to contribute to ongoing understanding of where DBT works, how, and for whom. Balancing ethical and clinical considerations with research goals will continue to be a primary dialectical dilemma. Making clinical progress monitoring research-friendly

would likely allow for feedback to be provided to the clinic on the local effectiveness, and help clinicians streamline the teaching of skill sets specific to a given client's symptom presentation.

APPENDIX A

BORDERLINE SYMPTOM CHECKLIST FOR DIALECTICAL BEHAVIOR
THERAPY

DBT Areas of Dysregulation Checklist - Short Version

Client Name: _____ Therapist Name: _____
Date: _____

Part A.

For the following questions, write the **number of times** each has occurred DURING THE LAST WEEK.

How many times:

Have you attempted suicide? _____

Have you physically hurt yourself on purpose? _____

Have you threatened to commit suicide? _____

Have you had thoughts about suicide or wishing you were dead? _____

Have you engaged in self-damaging impulsive behaviors, like substance abuse, disordered eating, reckless driving, risky sex, etc? _____

Have you felt outside of your body? _____

Part B.

For the following questions, use the scale below to rate **how characteristic** each has been for you DURING THE LAST WEEK.

| | | | | | | |
|------------|---|----------|---|----------|---|-----------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Not at All | | Slightly | | Somewhat | | Extremely |

How characteristic for you are/is:

Unstable or volatile interpersonal relationships? _____

Fear of abandonment/rejection/disapproval? _____

Inability to control anger? _____

Intense instability of mood? _____

Unsure of identity? _____

Feeling empty? _____

Feeling that others were out to get you? _____

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