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# Dialectical Behavior Therapy in State Hospitals: Does It Work and What Moderates the Outcomes?

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DIALECTICAL BEHAVIOR THERAPY IN STATE HOSPITALS: DOES IT WORK  
AND WHAT MODERATES THE OUTCOMES?

by

Amanda L. Collins

A DISSERTATION

Presented to the Faculty of  
The Graduate College at the University of Nebraska  
In Partial Fulfillment of Requirements  
For the Degree of Doctor of Philosophy

Major: Psychology

Under the Supervision of Professor William D. Spaulding

Lincoln, Nebraska

August, 2010

# DIALECTICAL BEHAVIOR THERAPY IN STATE HOSPITALS: DOES IT WORK AND WHAT MODERATES THE OUTCOMES?

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University of Nebraska, 2010

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Dialectical Behavior Therapy (DBT) demonstrates effectiveness in the treatment of individuals diagnosed with Borderline Personality Disorder in an outpatient setting. DBT has also been adapted for inpatient settings and demonstrates effectiveness with this population. To date no published literature examines the effectiveness of the standard outpatient model implemented in an inpatient setting. Furthermore, the literature examining inpatient DBT is done on treatment units where DBT is the sole treatment modality. There is no published literature regarding the use of DBT in conjunction with another treatment program. Therefore, this study examines the effectiveness of the standard outpatient DBT model implemented in conjunction with psychosocial rehabilitation or treatment as usual in a state hospital. This study also examined the effects of neuropsychological functioning and symptomatology on DBT outcome, as all previous research excludes individuals with psychotic disorders, bipolar disorder, and cognitive impairments. Results suggest that the standard outpatient DBT model can benefit individuals in a state hospital, that individuals who receive psychosocial rehabilitation in conjunction with DBT demonstrate more benefit than individuals who receive treatment as usual in conjunction with DBT, that neuropsychological functioning has an impact on DBT outcomes, and that positive symptoms do not impact DBT outcomes.

*To my parents*

for their unwavering support. Their love, encouragement, and strong belief in me led me to follow my dreams, find my passion, and complete my Ph.D.

*To my fiancé*

for his love, patience, support and encouragement through the toughest challenges of graduate school.

*To Andy and Judy*

who have provided mentorship, guidance, support, and friendship for many years.

*To the Staff at the Community Transition Program*

who showed their passion for working with serious mental illness and demonstrated their belief that recovery is possible on a daily basis.

*To all the CTP Participants*

whose strength and determination to recover was, and continues to be, my most motivating factor.

## ACKNOWLEDGMENTS

I would like to thank the Lincoln Regional Center for allowing me to complete the study at their facility.

I would like to thank all of the past graduate students in the Serious Mental Illness Lab who put in numerous hours at the Community Transition Program collecting data over the years.

I would like to thank the following individuals for their constant help and encouragement, without their support this study would not have been possible:

Tami Burkey

Lisa Barnes

Kalan Root

Kerry Miller Loos

Jeff Nolting

Felice Reddy

Finally, and most importantly, I would like to thank Dr. William Spaulding for his mentorship and support throughout my time in Nebraska. He gave me the strong belief that rehabilitation and recovery can occur for anyone and he provided the knowledge to make it a reality.

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## CHAPTER 1

### INTRODUCTION

Borderline Personality Disorder (BPD) can be one of the most severe and discouraging disorders that mental health clinicians treat during their careers. For the individual diagnosed with BPD, life is full of misery, intense distress, suicidal and parasuicidal behaviors, and repeated failures in treatment (Koerner & Dimeff, 2007). The clinician and the client may find even effective treatment slow, extremely painful, and full of difficult challenges. Treatment can become so difficult that all too frequently clients drop out, therapists reach burnout and stop seeing the client, and inpatient hospitalizations are initiated. Unfortunately, even inpatient hospitalization often provides no relief and results in iatrogenic effects for those with this diagnosis (Miller 1989; Swenson, Sanderson, Dulit et al., 2001; Bohus, Haaf, Stiglmayr et al., 2000; Linehan, Comtois, Murray et al., 2006).

One may wonder why treatment is attempted in the first place, as outpatient treatment is often ineffective and inpatient treatment can have iatrogenic effects. However, despite the difficulty, treatment cannot be ignored for a group of individuals that comprise 11% of all outpatients and 19% of all inpatients (Geller, 1986; Widiger & Weissman, 1991; Loranger, Sartorius, Andreoli et al., 1994; Koerner & Dimeff, 2007). Furthermore, the importance of effective treatment is brought to light when one realizes that 97% of individuals with this diagnosis present for outpatient treatment with an average of 6.1 previous therapists and that 72% of individuals with this diagnosis require inpatient psychiatric treatment at least once in their lifetime (Skodol, Buckley, & Charles, 1983; Perry, Herman, & van der Kolk, 1990; Bender, Dolan, Skodol et al., 2001). These

extremely high percentages make it easy to see how this population consumes up to 40% of all U.S. mental health services (Koerner & Dimeff).

In addition to the large number of mental health resources devoted to the treatment of BPD, there are a number of other costs associated with this diagnosis. These other expenses include: (a) medical costs due to suicidal and parasuicidal behaviors; (b) social service resources such as unemployment, psychiatric disability, and public assistance; and (c) legal costs due to civil suits and criminal offenses (Linehan & Heard, 1999). It is estimated that 69% to 80% of individuals diagnosed with BPD engage in suicidal behaviors that often require medical attention (Soloff, Lis, Kelly et al., 1994; Zisook, Goff, Sledge et al., 1994). Furthermore, in one study, 50% of all BPD participants received psychiatric disability for at least one month, 30% received public assistance, and 10% reported living in a group home for at least one month (Linehan & Heard).

Despite the enormous amount of resources devoted to individuals with this diagnosis, recovery continues to be slow and, in all too many cases, nonexistent (Tucker, Bauer, Wagner et al., 1987; Linehan, Heard, & Armstrong, 1993; Linehan, Comtois, Murray et al., 2006). In fact, researchers who have followed individuals with the diagnosis of BPD found that 60% to 70% continue to meet diagnostic criteria two to three years after initial assessment (Barasch, Frances, Hurt et al., 1985; Stevenson & Meares, 1992) and those who have followed individuals for four to seven years after initial assessment still found that 57% to 67% continue to meet diagnostic criteria (Pope, Jonas, Hudson et al., 1983). Even more disconcerting is the fact that researchers have found that 25% to 44% still met diagnostic criteria 15 years after initial assessment (McGlashan,

1986; Paris, Brown, & Nowlis, 1987). This data clearly demonstrate that the treatments provided to the majority of individuals with BPD, whether outpatient or inpatient, are simply ineffective.

### A Possible Answer: Dialectical Behavioral Therapy

The amount of misery experienced by individuals with this disorder, the number of difficulties therapists encounter in the treatment of this disorder, and the sheer number of resources devoted to this disorder led researchers, clinicians, policymakers, and administrators on a search for an effective treatment (Linehan, 1993a). Dialectical Behavior Therapy (DBT) is one treatment that has shown effectiveness with individuals diagnosed with BPD, and especially with individuals who engage in parasuicidal and suicidal behavior (e.g., Linehan, Armstrong, Suarez et al., 1991; Linehan, Tutek, Heard et al., 1994; Linehan, Heard, & Armstrong, 1993; Verheul, Van Den Bosch, Koeter et al., 2003; Linehan et al., 2006). This therapy is based upon principles of cognitive, behavioral, and supportive therapies, as well as the principles of Eastern Zen practices (Linehan et al., 1991; Linehan, 1993a; Swenson et al., 2001). Treatment is based upon the biosocial view of BPD and the belief that emotional dysregulation is the primary problem experienced by individuals with this diagnosis (Linehan, 1993a; Swenson et al., 2001).

DBT combines problem-solving strategies, exposure techniques, skills training, contingency management, and cognitive restructuring techniques with acceptance strategies such as validation and empathy (Linehan, 1993a; Swenson et al., 2001). Furthermore, DBT places a strong emphasis on *dialectics*, “the reconciliation of opposites in a continual process of synthesis” (Linehan, 1993a p. 19). DBT is conducted utilizing six primary treatment targets (decreasing parasuicidal and suicidal behavior,

decreasing therapy-interfering behaviors, decreasing behaviors that interfere with a high quality of life, increasing behavioral skills, decreasing behaviors related to Posttraumatic stress, and increasing self-respect), two core treatment strategies (validation and problem solving), and four treatment modes (individual therapy, skills training, phone consultation, and therapist case consultation), with an emphasis on balancing three dialectical dilemma dimensions (emotional vulnerability vs. self-invalidation, active passivity vs. apparent competence, and unrelenting crises vs. inhibited grief) and teaching four types of skills (interpersonal effectiveness, distress tolerance, emotion regulation, and mindfulness; Linehan, 1993a).

#### *The Biosocial Theory of BPD*

As mentioned previously, Linehan (1993a) developed a treatment of Borderline Personality Disorder based upon a biosocial theory of the disorder. The main premise is that the problems faced by individuals with BPD are caused by a combination of extreme emotional vulnerability and an invalidating living environment. The emotional vulnerability, which is viewed as genetically determined, results in an increased need for emotion regulation skills. However, despite the need, individuals with this disorder often lack effective regulation skills. Then, when the emotional vulnerability and lack of effective regulation skills is combined with an invalidating environment, individuals demonstrate behaviors consistent with a diagnosis of BPD.

Linehan (1993a) describes *emotional vulnerability* as being highly sensitive to emotional stimuli, experiencing intense emotional reactions, and demonstrating a slow return to “emotional baseline” (p. 43). In other words, the individual reacts quickly and extremely to very small emotional stimuli and these emotional reactions last a long time.



These long reactions are due to the fact that the individual's mood continues to affect their thinking patterns, resulting in a continuance of that mood. Furthermore, these long periods of emotional arousal contribute to the quick and extreme reaction to the next emotional stimuli. For example, an individual with BPD may react to slight irritation with extreme rage. This rage continues to affect her cognitions, which lengthens the time she will experience it. Then, due to the intense rage that she continues to experience, the next small emotional stimuli that she encounters will result in another quick and intense emotional reaction.

Linehan (1993a) describes an *invalidating environment* as one that responds to an individual's private emotional expressions with inconsistent, inappropriate, and intense reactions. Negative emotions that the individual may be experiencing are often disregarded and even punished. This invalidation leads the individual to mistrust her own interpretation of her feelings, beliefs, and behaviors and it leads her to believe that her responses are due to intolerable personality traits. Linehan describes a number of consequences that may be caused by living in such an environment: (a) the individual never learns to label or regulate her experiences; (b) the individual never learns to tolerate distress or set appropriate goals and expectations; (c) the individual learns that extreme behaviors or reactions are often required in order to get a response that is helpful (which leads to reinforcement of extreme behaviors and emotions); (d) the individual learns to mistrust her own experiences and the interpretations of those experiences and to look to the environment to tell her how she should feel, think, and behave.

The combination of emotional vulnerability and invalidating environments often results in the extreme behaviors demonstrated by individuals with BPD. Linehan (1993a)

views these behaviors as attempts to regulate extreme emotions and the environment. For example, suicidal and parasuicidal behavior is viewed as a maladaptive strategy to deal with negative emotions that are experienced as overpowering, extreme, and unmanageable. The demonstration of these extreme behaviors often results in a helpful response from the environment. Therefore, the individual is receiving two forms of reinforcement following these behaviors. The first form of reinforcement involves alleviation of the overwhelming negative feelings and the second form involves a helping response from the environment. Over time, this reinforcement schedule develops an extreme behavior pattern that is highly destructive and extremely difficult to treat.

Building upon the biosocial theory of BPD, Linehan (1993a) posits specific behavioral patterns often demonstrated in this diagnosis: (a) emotional vulnerability; (b) self-invalidation; (c) unrelenting crises; (d) inhibited grieving; (e) active passivity; and (f) apparent competency. As discussed above, emotional vulnerability is a pattern of quick and extreme reactions to small emotional stimuli that last a long time. Self-invalidation is the inability to identify and label emotional experiences, thoughts, beliefs, and behaviors. Unrelenting crises refers to the consistent negative environmental events that may be caused by fate, a poor social environment, or ineffective life choices. Inhibited grieving refers to continued attempts to ignore negative emotions. Active passivity refers to the tendency to actively avoid solving problems and actively attempting to have others solve problems for them. Finally, apparent competency refers to the tendency for individuals with BPD to appear far more competent than they are in reality.

As oppose to describing BPD using diagnostic criteria, Linehan (1993a) identifies five specific categories of dysfunction: emotional dysregulation, interpersonal

dysregulation, behavioral dysregulation, cognitive dysregulation, and self-dysregulation. Emotional dysregulation is often observed through anger problems, severe depression, and feelings of intense guilt and shame. Interpersonal dysregulation is likely observed through chaotic relationships and extreme fear of abandonment. Behavioral dysregulation is observed through suicidal and parasuicidal behavior and impulse control problems. Cognitive dysregulation is often observed through black-and-white thinking and dissociative experiences. Finally, self-dysregulation is likely observed through identity disturbance and reported feelings of emptiness.

#### *Description of Standard Dialectical Behavioral Therapy*

Linehan's biosocial theory of BPD led to the development of Dialectical Behavioral Therapy. Based upon her theory, Linehan (1993a) proposes that treatment should focus on two main areas. The first area is learning to manage extreme emotions and decrease the number of behaviors based upon these extreme emotions and the second area is to teach the individual to trust and validate her own experiences. In order to reach these goals, therapy should focus on skill acquisition, behavioral change, and validation of the client's experiences and abilities. Skills should focus on teaching the client to regulate emotions, tolerate distressing situations and crises, manage interpersonal relationships in an effective manner, and experience emotions mindfully. Achieving these goals requires focusing on a variety of treatment targets, utilizing all four modes of treatment, and skillfully integrating the major treatment strategies into therapeutic interactions.

*Treatment Targets.* DBT has six distinct treatment targets: (a) decreasing suicidal and parasuicidal behavior; (b) decreasing therapy-interfering behaviors; (c) decreasing quality of life interfering behaviors; (d) increasing behavioral skills; (e) decreasing

symptoms related to posttraumatic stress as many patients diagnosed with BPD have a history of trauma, especially sexual abuse; and (f) increasing self-respect (Linehan, 1993a). The behavioral targets have a specific order in which they are treated. Suicidal and parasuicidal behaviors are first, therapy-interfering behaviors are second, quality of life interfering behaviors are third. Throughout the course of treatment, clients are working on learning and increasing the use of their skills. Once these targets have been addressed, treatment can focus on issues related to trauma followed by helping the client develop self-respect and develop skills related to self-validation.

Treatment focused on the above treatment targets begins during the first session, when the therapist explains treatment procedures and attempts to reach agreement with the client on therapy goals. Before therapy can begin, the client must agree to work on decreasing suicidal and parasuicidal behaviors, decreasing therapy-interfering behaviors, and increasing behavioral skills. If the client will not agree to work towards these goals, then the individual is not accepted into treatment. Due to the need for an agreement on these behaviors, and the possibility that some individuals may not be ready to make these agreements, it is suggested that settings who have a legal and ethical obligation to provide treatment utilize “a program within a program” (Linehan, 1993a, p.98). Therefore, clients can be rejected from this particular treatment, but still receive another form of therapy.

*Treatment modes.* Treatment modes refer to how the treatment is delivered (Koerner & Dimeff, 2007). There are four separate modes of treatment in DBT, individual psychotherapy, group skills training, telephone consultation, and therapy case consultation (Linehan, 1993a). Individual psychotherapy sessions are generally 50-60 to

90-110 minutes and are held one time per week. However, during times of extreme stress and during the very early stages of treatment, individual sessions can be held twice per week. The individual therapist holds the responsibility for helping the patient utilize adaptive behavioral skills and for observing and recognizing environmental factors that may be a barrier for replacing maladaptive strategies with adaptive ones (Linehan).

In addition to the above responsibilities, the individual therapist has the task of developing a strong interpersonal relationship with the client. This is an extremely important part of therapy, as the relationship with the individual therapist is often the only effective reinforcement for the client. The relationship can be used to help the client learn to regulate and change their long-standing maladaptive behavioral patterns (Linehan, 1993a). Furthermore, as Linehan points out that, like many other schools of therapy, feeling truly cared for and accepted is often a strong client motivator.

Individual therapy takes place in conjunction with group skills training. In fact, clients who are participating in individual therapy must also participate in group skills training for the first year of DBT. Skills training sessions are usually held one time per week for two to two and one half hours; however, other formats can be just as effective (Linehan, 1993a). Skill sessions are provided in a psychoeducational format and teach the skills related to emotion regulation, interpersonal effectiveness, distress tolerance, and mindfulness. The group generally spends six weeks on the emotion regulation, interpersonal effectiveness, and distress tolerance modules with two weeks spent on the mindfulness module between each six-week module. Mindfulness is the first module taught and it is taught repeatedly throughout the course of a full treatment cycle because all other skills modules build upon the core mindfulness skills (Linehan, 1993b).

Telephone consultation occurs between sessions and involves the client and the client's individual therapist. Phone consultation is a very important part of DBT because it helps clients learn to generalize the skills they learn in session and group to their everyday lives. Furthermore, individuals with BPD often demonstrate extreme difficulty asking for help appropriately. Finally, phone consultation offers the client a way to restore the feeling of a strong relationship with the therapist without having to wait until the following week when misunderstandings occur (Linehan, 1993a).

Therapist case consultation is the final mode of treatment that occurs. All therapists agree to attend the regularly scheduled case consultation meetings. These can include a therapist and a supervisor, a group of peer therapists, or other members of the patient's treatment team. The purpose of these meetings is to help therapists maintain the dialectical stance within their treatment, to minimize treatment drift, and provide needed support as therapists work with this challenging population (Linehan, 1993a).

*Treatment Strategies.* The two major treatment strategies applied in DBT are validation strategies and problem solving strategies. Although these strategies may appear to be in conflict, as it may be difficult to focus on validating clients' experiences while at the same time focusing on helping clients solve their problems, it is important to maintain a balance between the two strategies for DBT to be effective. There are two types of validation used in therapy. The first includes the therapist finding wisdom, correctness, and/or value in the cognitions, emotions, and behaviors of the client. The second type of validation involves the therapist believing that the client has the ability to build a quality life and stop living her life in misery (Linehan, 1993).

The problem solving strategies fall into five different categories. The first includes conducting a behavioral chain analysis when target behaviors occur. The second includes conducting a solution analysis after the chain analysis of the target behavior has been completed in order to identify points where more adaptive behaviors could have been utilized. The third strategy includes working with the client to understand the proposed solution and how to utilize it. The fourth involves getting the patient to commit to trying the proposed treatment solution. Finally, the fifth strategy includes applying the treatment that was discussed (Linehan, 1993).

While implementing the validation and problem solving strategies addressed above, therapists utilize two different communication strategies, irreverent and reciprocal. The irreverent communication style is used to get the patients attention. These comments are often the opposite of what the client may expect to hear and often knock the client off balance, so to speak. In fact, the purpose of this communication style is to force the client and therapist to rebalance their positions (Linehan, 1993a).

In order to maintain balance in session, the therapist opposes the irreverent communication style with the reciprocal communication style. This may be seen as the client-centered portion of therapy, as communication is described as responding directly to what the client is saying in a warm and empathetic manner. This style may also involve self-disclosure, as the therapist demonstrates the ability to handle stressful and problematic situations in an adaptive manner (Linehan, 1993a).

*Dialectical Dilemmas.* One of the major premises of DBT is maintaining balance. This is apparent when trying to balance communication styles and treatment strategies. In fact, this often starts with the client demonstrating extreme cognitions, behaviors, and

emotions. In session, the therapist attempts to balance out the client on the imaginary teeter-totter. However, while the therapist is skillfully maintaining a balance with the client, they are also trying to move the client towards the middle of the teeter-totter. It is the goal to teach the client to moderate her thoughts, feelings, and behaviors (Linehan, 1993a).

A core area of balance in DBT is the group of three dialectical dilemmas faced by the therapist and client. All three areas have polar opposites that clients vacillate between throughout the course of therapy. The three dialectical dilemmas include emotional vulnerability versus self-invalidation, active passivity versus apparent competence, and unrelenting crises versus inhibited grief. Emotional vulnerability, active passivity, and unrelenting crises are theorized to be caused by biological processes, whereas self-invalidation, apparent competence, and inhibited grief are theorized to be caused by the social reactions to the clients' emotional expression. It is the responsibility of the therapist to skillfully maintain balance with the client while, at the same time, moving the client to a balanced position among all of these dilemmas (Linehan, 1993a).

In conclusion, DBT is based upon the therapist utilizing validation and problem solving techniques to move the client towards more balanced thoughts, emotions, and behaviors. Therapists teach skills to decrease suicidal and parasuicidal behaviors, decrease therapy-interfering behaviors, and increase clients' quality of life. Following progress on these three goals, the therapist switches the focus to problems associated with posttraumatic stress and self-respect. Therapists teach these skills through individual psychotherapy and group skills training sessions, help the client generalize these skills to



their everyday lives through telephone consultation, and maintain their fidelity to the DBT model through weekly case consultation meetings.

#### Effectiveness of Standard DBT in Outpatient Practice

DBT has been evaluated in four randomized controlled trials (RCTs) to date (Linehan et al., 1991; Linehan et al., 1994; Verheul et al., 2003; Linehan et al., 2006). The first RCT was published by Linehan and colleagues (1991) and evaluated the effects of the treatment in comparison to treatment as usual (TAU) on parasuicidal behaviors, the amount of medical risk during the acts of parasuicide, the number of clients who remained in therapy, the number of days spent in the hospital during treatment, the level of clients' depression, the level of clients' hopelessness, the level of clients' suicidal ideation, and the clients' reasons for living. The study included a total of 44 participants, 22 received DBT and 22 received TAU. All participants met the following inclusion criteria: (a) all met diagnostic criteria for BPD according to DSM-III and scored at least a 7 out of 10 on the Diagnostic Interview for Borderlines; (b) all had demonstrated at least two instances of parasuicidal behavior in the past five years, with at least one instance occurring in the past eight weeks; (c) all were between the ages of 18 and 45; and (d) all agreed to the conditions of the study, which included terminating other psychotherapy if assigned to the DBT condition. Participants were excluded from this study if they met diagnostic criteria for schizophrenia, bipolar disorder, substance dependence, and/or mental retardation.

The results of this study indicated that participants receiving DBT engaged in fewer parasuicidal acts, had significantly lower medical risk (a score was calculated by summing method of lethality scored on a scale from 0-5, physical condition scored on a

scale from 0-4, and medical treatment scored on a scale from 0-5), and spent fewer days in an inpatient psychiatric setting than those individuals who received TAU. Furthermore, significantly more individuals who were receiving DBT remained in therapy with the same therapist for one year. It is also noted that fewer participants who received DBT had admissions to psychiatric hospitals compared to the number of participants in the TAU condition (35% and 55%, respectively); however, this difference was not significant. Finally, this study found that the above differences in treatment occurred despite the fact that there were no differences between the two groups on depression, hopelessness, suicidal ideation, and reasons for living following treatment (Linehan et al., 1991).

The follow-up data from the above the Linehan and colleagues 1991 RCT was published in 1993. The purpose of the study was to examine the sustained efficacy of DBT in comparison to TAU in regards to parasuicidal behavior, medically treated instances of parasuicidal behavior, days spent in psychiatric hospitalization, anger, global functioning, social adjustment, work performance, anxious rumination, and employment performance at six and twelve months post- treatment. A total of 59 subjects (DBT = 28, TAU = 31) were included in the first cohort of the follow-up study and were assessed on parasuicidal behaviors, medically treated instances of parasuicidal behavior, and days spent in psychiatric hospitalization. Twenty (DBT = 9, TAU = 11) were added to the original study of 39 participants (DBT = 19, TAU = 20) and completed all of the above measures plus instruments assessing anger, global functioning, and social adjustment (Linehan et al., 1993).

The results of this study demonstrated that participants completing DBT had significantly fewer episodes of parasuicidal behavior and instances of parasuicide that

required medical attention at 6 months post-treatment than participants completing the TAU condition; however, there was no significant difference between the two groups on these two variables at 12 months post-treatment. In regards to number of psychiatric inpatient days, there was no difference between participants completing DBT and TAU at 6 months post-treatment; however, at 12 months post-treatment those completing DBT had significantly fewer days in the hospital than those completing TAU. Significantly less anger and significantly better self-reported social adjustment was demonstrated for individuals completing DBT in comparison to TAU at 6 months post-treatment, but no differences between groups were found at 12 months post-treatment. Overall social adjustment as rated by an interview was better for participants completing DBT than TAU at 12 months post-treatment, but not at 6 months post-treatment. Employment performance and global adjustment were significantly higher for individuals completing DBT in comparison to TAU at both the 6 and 12 month post-treatment assessment times. Finally, there were no significant differences between work performance and anxious rumination at either 6 or 12 months post-treatment (Linehan et al., 1993).

The second RCT by Linehan and colleagues was originally presented in 1992, but was not published until 1994. The purpose of this study was to examine general and interpersonal outcomes associated with DBT, including anger, global functioning, and social adjustment, at pretreatment, 4 months, 8 months, and 12 months post-treatment. This study included 26 participants, 13 received DBT and 13 received TAU. All participants met the same inclusion and exclusion criteria as described in the above study by Linehan and colleagues (1991). The results of this study demonstrated that

participants receiving DBT, in comparison to those receiving TAU, reported having significantly lower anger and significantly better overall social adjustment. Furthermore, interviewers rated participants receiving DBT as having better overall functioning and social adjustment in comparison to those receiving TAU. However, it is important to note that there was no difference between participants receiving DBT and those receiving TAU in the amount of reported general satisfaction.

The overall results of this study led the researchers to conclude that DBT is effective in teaching clients to tolerate distress and decrease maladaptive behavior, but is not more effective than TAU in increasing overall life satisfaction and happiness. In other words, the researchers state that “subjects in the dialectical behavior therapy program acted better but were still miserable” (Linehan et al., 1994, p. 1775). Furthermore, the researchers concluded, based upon the 12 month post-treatment data, that the treatment gains are maintained. However, they also conclude that there is still significant impairment present after one year of treatment and suggest that more than one year of treatment is needed for participants with BPD.

Verheul and colleagues published the third RCT in 2003. This was the first RCT conducted outside the United States. The researchers examined the efficacy of DBT in comparison to TAU in regards to treatment retention, suicidal behavior, parasuicidal behavior, and impulsive behaviors at 11, 22, 33, 44, and 52 weeks into treatment. Further, the researchers examined the moderating effects of the severity of parasuicide measured at baseline on the efficacy of DBT. There were 58 participants in the study (DBT = 27, TAU = 31) and all met the following criteria: (a) between the ages of 18 and 70 years; (b) referred from addiction treatment centers, psychiatric hospitals, mental health care

centers, independent psychologists, independent psychiatrists, independent general practitioners, and self-referrals; and (c) met criteria for borderline personality disorder on the Structured Clinical Interview for DSM-IV Axis II personality disorders *and* the Personality Diagnostic Questionnaire, DSM-IV version. Further, potential participants were excluded if they met criteria for a DSM-IV diagnosis of bipolar disorder or a chronic psychotic disorder or had severe cognitive impairment (Verheul et al., 2003).

The results of the study showed that significantly more participants in the DBT condition remained in therapy with the same therapist for a year in comparison to participants in the TAU condition. Parasuicidal behaviors decreased throughout treatment for those in DBT and increased for those in TAU. At 52 weeks, 35% of participants in DBT and 57% of participants in TAU reported engaging in parasuicidal behavior in the past 6 months, which is a significant difference. In regards to impulsive behaviors (e.g., gambling, binge eating), participants in the DBT condition continually decreased these behaviors, while participants in TAU did not show a pattern of continual decrease. Finally, it was found that the severity of parasuicidal behavior moderated DBT effectiveness. DBT was a significantly better treatment than TAU for individuals categorized in the high-severity group (i.e., participating in 14 to 1000 acts of parasuicide), but DBT was not found to be a significantly better treatment than TAU for individuals categorized in the low-severity group (i.e., participating in 0 to 14 acts of parasuicide; Verheul et al., 2003).

The follow-up study to the Verheul and colleagues (2003) RCT was published in 2005 and examined the efficacy of DBT in comparison to TAU in regards to treatment retention, suicidal behavior, parasuicidal behavior, and impulsive behaviors at 6 months

post-treatment (van den Bosch, Koeter, Stijnen, Verheul, & van den Brink, 2005). The study contained the same 58 participants that were in the previously mentioned RCT. The inclusion and exclusion criteria were the same as the RCT. The follow-up data revealed that those who completed one year of DBT as compared to one year of TAU had significantly fewer impulsive behaviors (e.g., gambling and binge eating), self-harm behaviors, and alcohol consumption (categorized as impulsive behavior in the previous RCT) at 6 months post-treatment. A statistically significant difference was *not* found between the two groups at 6 months post-treatment for parasuicidal behaviors (defined in this study as suicide threats, preparation for suicide, and suicide attempts), drug use, and suicide attempts. However, it should be mentioned that during the 6 month post-treatment period, only one DBT participant (4%) attempted suicide, compared to six TAU participants (19%).

Finally, Linehan and colleagues published the fourth RCT in 2006. This study compared DBT to “community treatment by experts” (CTBE; p. 758). This study was designed as a dismantling study to examine what aspects of DBT may be responsible for its demonstrated efficacy. Therefore, Linehan and colleagues designed the CTBE condition to control for the following: “(1) availability of treatment; (2) assistance finding and getting to a first appointment with a therapist; (3) hours of individual psychotherapy offered; (4) therapist sex, training, clinical experience, and expertise; (5) availability of group clinical consultation; (6) allegiance to treatment approach; (7) institutional prestige associated with treatment; and (8) general factors associated with receiving any psychotherapy” (p. 758).

This study contained 101 participants (DBT = 52; CTBE = 49) who met the following inclusion criteria: (a) between 18 and 45 years of age; (b) met criteria for BPD; and (c) had at least 2 suicide attempts or parasuicidal behaviors in the past 5 years with at least one occurring in the past 8 weeks. Potential participants were excluded if they had ever had a diagnosis of a psychotic disorder, bipolar disorder, or mental retardation, had a seizure disorder that required medication, were legally mandated to treatment, or required treatment for another disabling condition. All assessments were completed at 4 month intervals during the treatment and follow-up phases (both phases lasted a total of 2 years) and examined suicidal behaviors, parasuicidal behaviors, medical severity if suicidal and parasuicidal behaviors, suicidal ideation, reasons for living, treatment history (i.e., past psychotherapy, treatment programs, case management, inpatient admissions, emergency and crisis services, and medications), and depression (Linehan et al., 2006).

The results of the study demonstrated that significantly fewer participants in the DBT condition had suicide attempts (23.1%) than individuals in the CTBE condition (46%); however, it is noted that no participants in the study completed suicide. Both conditions demonstrated significantly lower rates of parasuicidal behaviors, but there was no significant difference between the groups. However, the DBT group demonstrated significantly lower medical risk associated with the suicidal and parasuicidal behaviors than the CTBE condition. Both conditions also demonstrated significant improvements in suicidal ideation and reasons for living; however, there was no significant difference between the slopes of the two groups (Linehan et al., 2006).

In regards to crisis services, the DBT condition used significantly less services than the CTBE condition. Significantly fewer participants in the DBT condition went to

the emergency room for any psychiatric reason in comparison to the CTBE condition. Furthermore, significantly fewer participants in the DBT condition dropped out of therapy with their first therapist (DBT = 25%) compared to the CTBE condition (52.9%). Significantly fewer participants in the DBT condition dropped out of therapy all together (19.2%) compared to the CTBE condition (42.9%). Finally, both DBT and CTBE demonstrated significant decreases in depression; however, the slopes between the two conditions were not significantly different throughout the 2 year period (Linehan et al., 2006).

In conclusion, the results of the RCTs demonstrated that DBT is more effective than TAU in: (a) retaining clients diagnosed with BPD; (b) decreasing suicidal and parasuicidal behaviors, especially for high-risk clients; (c) decreasing the medical risk associated with the suicidal and parasuicidal acts; (d) reducing impulsive behaviors; (e) reducing anger; (f) increasing overall adjustment; (g) increasing social adjustment; (h) decreasing the number of days in inpatient psychiatric treatment facilities; and (i) decreasing the number of emergency services required. However, based upon the results of the above studies, it appears that one year of DBT is often not sufficient in decreasing depression and hopelessness. Therefore, it is has been suggested that clients complete more than one year of DBT in order to focus on decreasing their feelings of misery after they have decreased their life-threatening and therapy-interfering behaviors (Linehan et al., 1991; Verheul et al., 2003).

#### Adapting DBT for Inpatient Settings

DBT was originally developed for the treatment of outpatients; however, over the years researchers have adapted and implemented DBT into inpatient settings (Barley,



Buie, Peterson et al., 1993; Silk, Eisner, Allport et al., 1994; Springer, Lohr, Buchtel et al., 1996; Bohus et al., 2000; Bohus, Haaf, Simms et al., 2004; Kröger, Schweiger, Sipos et al., 2006). Although DBT appears to be a logical choice for inpatient settings due to its treatment efficacy in outpatient settings, there are a number of barriers to implementing DBT in these facilities. The most common difficulties faced include the following: (a) hospital settings have a tendency to reinforce maladaptive behaviors that are targets for treatment (Niemeier, 1983; Stuve & Menditto, 1999; Bohus et al., 2000; Swenson et al., 2001); (b) the inpatient environment can overload the patient with emotional triggers that make skills acquisition difficult, can create “contagion effects” of maladaptive behaviors, and can create another invalidating environment for the person (Swenson et al., 2001; Swenson et al., 2007); (c) hospital settings often create situations that run directly contrary to the DBT stance, including the power differential between the staff and patients and the negative biases towards patients with the diagnosis of BPD (Swenson et al., 2007); (d) the inpatient environment may not provide a setting where skills learned during admission will generalize to outpatient life (Swenson et al., 2007); (e) the length of stay in hospital settings is often limited due to financial reasons, which may decrease the treatment efficacy and limit the number of problems that can be targeted (Swenson et al., 2007; Bohus et al., 2000).

Contrary to the difficulties inherent in implementing DBT in an inpatient setting, there are a number of positive aspects to inpatient treatment for this population. It is noted that hospitalization can save lives, stop a crises from its downward spiral, provide outpatient clinicians a needed break, increase motivation to the client who feels hopeless, provide the time and safety for a medication trial, and provide a safe environment for

exposure to unmanageable emotions (Swenson et al., 2001; Swenson et al., 2007). More specifically, the inpatient unit providing DBT can provide an environment rich with opportunities to practice new skills and receive “in the moment” coaching, provide clear and specific goals for treatment while in the hospital and a plan for intervention following discharge, provide an opportunity to complete very detailed behavioral analyses of problem behaviors that may result in formulation changes and more effective solutions, and intense practice of DBT skills (Swenson et al., 2001; Swenson et al., 2007).

By taking advantage of the benefits of inpatient treatment and minimizing the difficulties inpatient treatment, adaptations have been made to DBT in order to make it possible to implement, maintain, and produce positive outcomes for inpatients diagnosed with BPD (Swenson et al., 2001; Swenson et al., 2007). The major adaptations for inpatient DBT are made to the overall treatment targets. The overall treatment targets in standard DBT focus upon suicidal and parasuicidal behavior, therapy interfering behaviors, quality of life, Posttraumatic Stress Disorder symptoms or other psychiatric problems, and self-respect all while patients are increasing their skills repertoire (Linehan, 1993a). However, progress for inpatient DBT is based upon stages or phases of treatment. The first stage of treatment is focused on developing a treatment plan and gaining client commitment. The second stage is focused on decreasing life-threatening behaviors leading to or prolonging hospitalization, decreasing therapy-destroying behaviors that lead to or prompted hospitalization, decreasing life-threatening behaviors occurring while admitted to the hospital that prolong the stay, and increasing skills. All of these targets are specifically focused on behaviors that prompted or prolong the hospitalization, and not on all behaviors that fall into these categories as in standard DBT.

Furthermore, therapy-*destroying* behaviors are targeted, as oppose to therapy-*interfering* behaviors that are targets for outpatient treatment. Finally, distress tolerance skills are especially important in short-term hospitalizations and followed by mindfulness, emotional regulation, and interpersonal effectiveness only if time allows (Bohus et al., 2000; Swenson et al., 2001; Bohus et al., 2004; Swenson et al., 2007).

#### *Important Aspects of Inpatient DBT*

There are a few important treatment strategies inherent in inpatient DBT that distinguish it from standard DBT. The first is the importance placed on the initial chain analysis that is conducted on the events that led up to the current hospitalization. This behavioral chain is started immediately upon admission to the program (Bohus et al., 2000; Swenson et al., 2001; Bohus, 2004; Swenson et al., 2007). The chain should identify patient vulnerabilities, the initial event that started a cascading chain of thoughts, feelings, and behaviors, and other problem behaviors this cascade of events sparked that resulted in admission to an inpatient setting. The purpose of this chain is to provide the treatment team with a starting point when developing the initial treatment plan (Swenson et al., 2007).

The second important treatment strategy is the development of the initial treatment plan. The initial treatment plan should include the factors identified as having led up to the current hospitalization, factors identified as possibly prolonging the inpatient admission, and the skills and resources needed to stay out of the hospital in the future. The final treatment plan should include a list of goals, a list of treatment targets, the approximate time frame of the hospitalization, and the methods for reaching the stated goals and treatment targets. In fact, this treatment plan leads directly to the creation of the

individual patient's diary card, which is a list of treatment targets that is completed daily by the individual client and guides individual psychotherapy sessions (Swenson et al., 2001; Swenson et al., 2007).

The third important treatment strategy is the protocol for egregious behavior that is often utilized in DBT inpatient programs. The protocol is comprised of three different stages. Following the DBT model, the first step in the protocol is for the patient to complete a behavioral analysis on the event. The patient works alone on completing the chain, but it is then reviewed with a staff member in a short meeting. The purpose of the short meeting is to reinforce good work, suggest additions to the chain, and point out patterns. The second stage includes the patient meeting with other DBT patients and presenting their chain in order to receive feedback. Following the meeting with other patients, the patient who completed the behavioral chain meets a second time with staff members to prepare for the last stage. The last stage includes the patient repairing any damage that may have been caused by their behavior, which could include meeting with others who witnessed and were impacted by the event or paying for damages to the unit. It is important to note that while on working on the protocol, the patient does not attend any other aspect of their treatment (Swenson et al., 2001).

#### Effectiveness of Inpatient DBT

There have been at least six studies examining the effectiveness of DBT on inpatient adult units (Barley et al., 1993; Silk et al., 1994; Springer et al., 1996; Bohus et al., 2000, 2004; Kröger et al., 2006); however, only two of these studies were RCTs (Springer et al., 1996; Bohus et al., 2004). Because an RCT is the “gold standard” of research (Rossi, Lipsey, Freeman, 2004, p. 237), the first two studies examined will be

the Springer and colleagues' 1996 and Bohus and colleagues' 2004 RCTs and the remainder of the studies will be examined as supporting evidence. Springer and colleagues (1996) published the first RCT of a DBT-based inpatient program. This group compared outcomes on depression, hopelessness, suicidal ideation, anger, locus of control, increased coping skill knowledge, and acting out on the unit from participants completing the DBT-based Creating Coping group and from participants completing the Wellness and Lifestyles group. The Creative Coping group was ten sessions long and included five sessions on emotion regulation, 4 on interpersonal effectiveness, and one on distress tolerance. No mindfulness skills were taught. The group ran for 45 minutes Monday through Friday. The Wellness and Lifestyles group was focused on topics of interest for the patients, such as recreation, health and fitness, families, hobbies, and current events. There were no therapeutically-oriented goals for this group, such as increased insight. This group met for 45 minutes Monday through Friday at the same time as the Creative Coping group.

This study included 31 participants, both male (32.3%) and female (67.7%), for which 16 were assigned to the Creative Coping group and 15 to the Wellness and Lifestyles group. Participants were consenting participants from a general inpatient unit at a university hospital. Potential participants were excluded if they had a diagnosis of schizophrenia, chronic psychosis, organic brain damage, mental retardation, mania, or anorexia or bulimia. Further, participants who had been hospitalized and participated in the Creative Coping group in the past were excluded. The most frequent diagnosis according to the MCMI-II was cluster C personality disorders (anxious and avoidant), as

oppose to cluster B (dramatic and unpredictable behavior) that includes the diagnosis of Borderline Personality Disorder (Springer et al., 1996).

The results of this study demonstrated *no* significant differences between the two groups on all variables with the exception of acting out behaviors. Acting out behaviors were significantly higher in the Creative Coping group than in the Wellness and Lifestyle group, which is directly contrary to the results expected and from other studies completed on DBT. However, it should be noted that there was significant divergence from Linehan's model. The greatest divergence was the open discussion of parasuicidal behaviors in the Creative Coping group, which is *not* openly discussed in DBT. In fact, one of the rules for DBT skills group includes "Clients are not to discuss past (even if immediate) parasuicidal behaviors with other clients outside of session" (Linehan, 1993b, p. 108). Due to the open discussion in the Creative Coping group, it is hypothesized that the increase in acting out behaviors (parasuicidal behaviors) for this group was due partly to a contagion effect (Springer et al., 1996).

The second RCT was conducted by Bohus and colleagues (2004) and followed the Linehan model and the adaptations for inpatient DBT more closely (e.g., Swenson et al., 1993; Bohus et al., 2000). This study examined the outcomes from participants completing a three month inpatient DBT program to those on a 4-month wait list condition. The DBT inpatient program included 2 hours of individual therapy, 2 hours of group skills training, 1 hour of psychoeducation, 2 hours of peer group meetings, 1 hour of mindfulness group, 1 ½ hours of individual body-oriented therapy a week, and 2 hours of therapist case consultation meetings per week. The wait list control condition included some form of professional mental health services, which included an average of 44 days

of inpatient treatment for 12 of the 19 participants and an average of 6.1 outpatient treatment sessions for 14 of the 19 participants. The variables examined were: (a) number of parasuicidal acts; (b) symptomatology; (c) anxiety; (d) depression; (e) anger; (f) dissociation experiences; (g) global functioning; and (h) interpersonal functioning.

Participants in this study were all female and met criteria for BPD on the Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II) and the Diagnostic Interview for Borderline Personality Disorder-Revised (DIB-R) had demonstrated at least one suicide attempt and two parasuicidal acts within the last two years. Potential participants were excluded if they had ever received a diagnosis of schizophrenia, bipolar I disorder, and mental retardation. Furthermore, potential participants were excluded if they had a current diagnosis of substance abuse (Bohus et al., 2004).

Results of the study demonstrated that participants in the DBT group showed significant within-group improvement on all outcome measures, with the exception of anger. In regards to between-group comparisons, significantly more participants in the DBT group (62%) did not demonstrate any parasuicidal behavior at post-treatment assessment when compared to the wait list (WL) condition (31%). Furthermore, the DBT group showed a significant improvement over the WL condition on depression, global functioning, symptomatology, anxiety, and interpersonal functioning. However, there were no significant differences between groups on anger and dissociative experiences. Finally, 41.9% of the participants completing the DBT inpatient program improved in a clinically significant manner, defined in this study as moving from two standard

deviations above the mean to under two standard deviations above the mean on a measure of general symptom severity (Bohus et al., 2004).

The other studies completed on DBT in an inpatient setting have not been RCTs; however, they have provided detailed descriptions of their programs and outcome data. These studies will now be examined. Barley and colleagues published the first outcome study on an inpatient DBT program in 1993. This treatment program includes weekly skills training groups, weekly homework groups, semi-weekly fundamentals group, and individual psychotherapy from psychodynamically-oriented therapists. The fundamentals group provides a brief overview of each treatment module (mindfulness, interpersonal effectiveness, emotion regulation, and distress tolerance) with a specific focus on distress tolerance to help new participants deal with acute problems. The entire program runs for three months, with each treatment module lasting 3 weeks (in contrast to the 6 week of interpersonal effectiveness, emotion regulation, and distress tolerance and the 2 weeks of mindfulness between every module in standard DBT). Furthermore, it is noted that this program uses contingency management with hospital privileges for engagement and completion of DBT homework.

Preliminary outcome data on the program compared the DBT-oriented unit with a non-DBT treatment unit for three time periods: the 19 months prior to the introduction of DBT, the 10 months when DBT was being introduced and completely implemented on the unit, and the 14 months after DBT had been fully implemented. The parasuicidal rates on the unit were lower during the 14 months after DBT was fully implemented than the 19 months prior to DBT and the 10 months of the implementation process. Furthermore,



the same analyses were conducted on the non-DBT unit and there were no significant differences in parasuicidal rates for these three time periods (Barley et al., 1993).

Silk and colleagues published the second study examining DBT in an inpatient setting in 1994. One major difference of this study is that the DBT-oriented unit took place on a general psychiatric hospital, so diagnoses that are frequently excluded, such as schizophrenia, bipolar, organic brain damage, and eating disorders are admitted to the unit. Another major difference in this study is that the average length of stay is 7 to 14 days, which is significantly lower than the 3 month DBT programs discussed previously by Swenson and colleagues (1993) and Barley and colleagues (1993). However, it should be noted that patients admitted to this unit are to sign an agreement that states the patient will: (a) follow the specific treatment plan; (b) attend all scheduled groups and meetings; (c) follow all of the unit rules; (d) demonstrate behavior that ensures the safety of self and others; and (e) take an active role in their treatment plan. If the patient refuses to sign this agreement or is in need of a civil commitment they are transferred to another unit within the hospital or to another hospital in the community.

The program described by Silk and colleagues (1994) involves a Creative Coping group that is modeled after the DBT skills training group. However, while the DBT skills training group is a year long, Silk and colleagues only have an average of 7 to 10 days for patients to learn skills. Therefore, the group is based on 10 sessions that cover three modules, Emotional Control, Effectiveness, and Distress Tolerance. Emotional Control includes five sessions, understanding emotions, reducing emotional vulnerability, dealing with anger, problem solving, and cognitive restructuring. Effectiveness includes four sessions, needs assessment, needs effectiveness, interpersonal effectiveness, and

relatedness. Distress Tolerance includes only one session, but is integrated into the day-to-day treatment in the milieu. There is no published data on quantitative outcomes of this program; however, preliminary qualitative data indicate that patients found this group helpful, related to their personal concerns, important part of hospitalization, more beneficial than their other groups, and that the group would help them handle future stressful situations. In regards to staff perceptions, staff members feel more empowered with this group and no longer view individuals with BPD as “trouble-makers.” Finally, the authors indicate that many of the insurance companies paying for services reacted positively to the new model.

Prior to publishing their randomized controlled trial, Bohus and colleagues published a prospective study in 2000. Similar to this group’s RCT study, their model followed the adapted version of DBT for intermediate (approximately 3 months) inpatient treatment programs (Swenson et al., 1993). This prospective study included 24 female participants who met criteria for BPD and had demonstrated at least five parasuicidal acts and at least one suicidal act within the past two years. Potential participants were excluded if they had a diagnosis of schizophrenia spectrum disorders, bipolar I disorders, and mental retardation. Further, if a potential participant had a current diagnosis, or within the past six months had the diagnosis, of substance abuse they were excluded from the study. Results from this study indicated that participants completing this program demonstrated a decrease in total stress, intensity of symptoms, and total number of symptoms. These participants demonstrated a significant improvement on dissociation, depression, and anxiety. Finally, parasuicidal behaviors decreased during the four weeks post-discharge.

Finally, Kröger and colleagues published effectiveness data on an inpatient DBT program in 2006. The main purpose of this study was to examine the effects of DBT in a more general and severe population. However, potential participants were still excluded if they had a history or current symptoms of an organic condition, had a diagnosis of schizophrenia or bipolar disorder, and if they had a current diagnosis of substance abuse or dependence *without* motivation for abstaining. This program closely followed the adaptations described previously for intermediate stay inpatient DBT (Swenson et al., 1993; Bohus et al., 2000; Bohus et al., 2004). Results indicate that 41% of participants were re-hospitalized within the 15 month follow-up period, but 24% of these individuals were hospitalized for crisis-intervention and were admitted for two weeks or less. In regards to overall symptom severity and depression, these two outcomes variables significantly decreased throughout treatment. Further, for individuals in the DBT group, their global functioning significantly increased over time.

Overall, it appears there is an evidence-base supporting the effectiveness of DBT for inpatient settings. This evidence-base is especially strong for those programs utilizing the 3-month inpatient program first outlined by Swenson and colleagues (1993) and evaluated by Bohus and colleagues (2000, 2004). Results from these studies demonstrated that DBT is particularly effective in decreasing parasuicidal behaviors, and is often effective in decreasing depression, anxiety, global functioning, and symptom severity. Nevertheless, it appears that many of these studies exclude participants often treated in public psychiatric hospitals, such as those with diagnoses of schizophrenia, bipolar I, mental retardation, and substance abuse.

### DBT for Long-Term Settings

Although it appears that DBT programs are an informed choice for psychiatric inpatient settings, all of the research on inpatient DBT conducted in psychiatric hospitals has been published on programs that have an average length of stay of three months (Barley et al., 1993; Springer et al., 1996; Bohus et al., 2000, 2004; Kröger et al., 2006) and, in some cases, a much shorter length of stay (Silk et al., 1994). There are published studies of DBT in forensic settings that have implemented DBT for an entire year; however, with the exception of one published study, which will be examined in more detail below, these programs mainly treat male offenders with the diagnosis of Antisocial Personality Disorder and alter Linehan's model to a significant degree (such as substituting the entire Emotion Regulation module with a module that is focused more on helping participants gain emotional attachment instead of helping participants manage their overwhelming emotions; e.g., McCann, Ball, & Ivanoff, 2000).

The Low and colleagues (2001) study is the one published article examining the effects of a one-year DBT program with females in a high security hospital. All of the participants in this study met at least five criteria for a diagnosis of BPD, currently demonstrated parasuicidal behavior, and agreed to be in the study. All participants attended one skills training group per week that followed Linehan's group skills training model and met with their individual therapist one time per week. Outcome variables included the following: (a) acts of parasuicidal behavior; (b) depression; (c) dissociation experiences; (d) survival and coping beliefs; (e) suicidal ideation; and (f) impulsiveness.

The results of this study showed that participants significantly decreased the number of parasuicidal behaviors from pre-treatment levels at 6, 9, and 12 months of

treatment, showed an increase that was not significantly different from pre-treatment rates at 3 months post-treatment, and then showed a significant reduction in parasuicidal behaviors from baseline at 6 months post-treatment. Furthermore, participants significantly decreased their dissociation experiences and increased their survival and coping beliefs from their baseline level throughout treatment and during the two follow-up periods. Suicidal ideation was significantly lower at the end of treatment when compared to pre-treatment levels; however, it was not significantly lower at 6 months follow-up. The rest of the variables studied were not significantly different from baseline levels at the end of treatment or at the 6 month follow-up period (Low et al., 2001).

#### *Examination of an Unpublished Long-Term DBT Unit*

Although there are no other published studies of DBT for female populations in long-term inpatient settings, psychiatric hospital or forensic, there are programs currently in operation that utilize the Linehan model to provide treatment to female clients with the diagnosis of BPD. One program that will be examined is the program currently in operation at Fulton State Hospital. The New Outlook Program is an entire DBT-oriented unit that treats individuals with BPD who receive DBT services for much longer than the average 3 months as in the psychiatric inpatient studies addressed above and for much longer than the one year treatment program as examined in the Low and colleagues (2001) study described above.

This program is based upon five different stages of treatment, the “Orientation and Commitment” stage, the “Keeping Myself and Others Safe” stage, the “Therapy-Interfering Behaviors” stage, the “Quality of Life” stage, and the “Skills Improvement” stage. The goals of the “Orientation and Commitment” stage are to learn about the

program, commit to the program, and decide on their target behaviors. The goals of the “Keeping Myself and Others Safe” stage include monitoring urges and behaviors on a diary card, learning to use appropriate coping skills, using skills to keep yourself and other safe, using staff provided coaching to use skills, and decreasing dangerous target behaviors. The goals of the “Therapy-Interfering Behaviors” stage are to learn to recognize, monitor, and reduce therapy-interfering behaviors such as not participating with the treatment team, demonstrating hostile behaviors towards others, pushing the treatment team’s limits, and violating unit rules. The goal of the “Quality of Life” stage is to work on issues that stop the individual from having a quality of life, such as substance abuse, money management, academic problems, and healthy relationships. The goal of the “Skills Improvement” stage is to continue to practice and learn new skills that add to the skills the individual already knows and uses. Participants move through these stages based upon their behaviors and their level of demonstrated independence in managing their behaviors. Participants receive unit privileges based upon their current stage of treatment. If a person demonstrates a behavior that is dangerous to self or others while in stage 3, 4, or 5, the individual is to refocus and repair, which requires returning to Stage 2 (New Outlook Program Participant Orientation and Commitment Manual, 2008).

The New Outlook Program consists of 15 different treatment modes, which include the following: (a) DBT skills group, which is based upon the standard DBT skills group model; (b) Chaining group, which allows participants to discuss the events that led up to demonstrating a target behavior; (c) Choices group, which focuses on helping clients identify possible negative outcomes when faced with a difficult situation and how to avoid the negative outcomes when faced with the same problem again in the future; (d)

Offender Behavior group, which focuses on aggression and sex offending behaviors and helps individuals learn to keep themselves and others safe by monitoring behavior, managing behavior, and using appropriate coping skills; (e) Anger Management group, which teaches individuals to monitor, control, and express their anger in appropriate ways; (f) Substance Abuse group, which teach individuals how to deal with substance abuse and addiction issues; (g) Social Skills/Relationship groups, which teach individuals about different types of relationships and teach them effective interpersonal skills; (h) Work Skills Training, which allows clients the ability to learn and improve work skills through paid work opportunities; (i) Social and Leisure Activities focus on teaching clients how to use their free time in a positive manner and how to relate to others in a respectful manner; (j) Educational Services, which allows individuals to receive help working on their GED, learn basic computer skills, learn reading and writing skills, and receive help preparing to further their education in the future; (k) Repair Council, which is a group of participants that comes together to listen to a peer's chain analysis of a harmful behavior and the repairs that have been made following the harmful behavior (the council can accept the repairs or require more repairs to be completed); (l) Ward Government, which discusses ways to improve the unit; (m) Individual Therapy, meeting with an individual therapist is done at the recommendation of the treatment team when a client has a problem that requires more attention; (n) Skills Coaching, which is done by all staff members at all times in order to help clients use the new skills they are learning; (o) Competency Education, which is offered to those who are determined Incompetent to Proceed on their charges and focuses on the roles of the people in the courtroom and what

will take place during the trial (New Outlook Program Participant and Orientation Manual, 2008).

### The DBT Program at the Lincoln Regional Center

The current DBT program at the Lincoln Regional Center is unique, as it utilizes the standard outpatient DBT model in conjunction with psychiatric rehabilitation (PR) or treatment as usual (TAU). Despite the uniqueness of this model, it should be noted that some aspects of the DBT program at the Lincoln Regional Center were adapted from the Fulton State Hospital model. DBT treatment modes include one hour of individual therapy per week, two hours of skills group training, one or two hours of Diary Card Class per week (one hour for those in TAU and two hours for those in PR), telephone consultation for participants demonstrating commitment to their therapy, and one to two hours of therapist case consultation per week. Diary Card Class takes place four times a week for 30 minutes and focuses on skill practice and acquisition. Telephone consultation is offered because there are only two professional staff members trained in DBT in each building where this treatment is offered. Therefore, in an attempt to help participants generalize the new skills they are learning in DBT, the participant is allowed to have a brief (approximately 5 minutes) telephone consultation with their therapist if they have the privilege and request the telephone call prior to demonstrating an egregious behavior (e.g., self-harm, aggression, property destruction).

All participants receiving DBT have been referred to their treatment team because the team believes they demonstrate behaviors that would be treated best by DBT. Following initial referral from the treatment team, the assigned individual therapist meets with the participant in order to discuss the goals of DBT and to gain an initial



commitment to the therapy. If the individual client and therapist agree that DBT would be an appropriate treatment for the individual, then DBT is started. It is noted that DBT is offered to those based upon demonstrated behaviors and *not* strictly on a diagnosis of BPD. Participants receiving DBT attend all DBT treatment modes, as well as the groups and classes consistent with their treatment plan. DBT is one aspect of their treatment, but does not determine their entire treatment plan, as does the New Outlook Program at Fulton State Hospital.

#### The Potential Importance of Moderating Variables

Despite the exclusion criteria utilized in many of the studies examining the effectiveness of DBT, no research has been published on possible moderating variables on the outcome of DBT with the exception of the Verheul and colleagues (2003) study that found the degree of risk moderated the outcome of DBT in comparison to TAU. Common exclusion criteria, in both outpatient and inpatient settings, include: a) a diagnosis of schizophrenia, bipolar disorder, substance dependence, and/or mental retardation; b) evidence of cognitive impairment; c) a seizure disorder requiring medication; and a d) a legal mandate for treatment (Linehan et al., 1991; Linehan et al., 1993; Linehan et al., 1994; Verheul et al., 2003; Linehan et al., 2006; Barley et al., 1993; Silk et al., 1994; Springer et al., 1996; Bohus et al., 2000; Bohus et al., 2004; Kröger et al., 2006). Many of these exclusion variables are extremely common for inpatient settings, especially state psychiatric hospital populations. In fact, a good portion of individuals receiving DBT services in the Lincoln Regional Center would meet exclusion criteria in the previously published studies, including the inpatient DBT studies.

Therefore, it is important to examine the effects that these variables have on the outcome of DBT.

### Study Purpose and Hypotheses

In summary, the first purpose of this study is to examine the outcomes associated with individuals receiving DBT services at the Lincoln Regional Center (LRC). All published literature examining DBT in psychiatric hospitals has been with the adapted inpatient model of DBT, while there is no published research examining the effects of implementing the standard outpatient DBT model within the context of a psychiatric hospital. Therefore, this study examines the outcome of individuals receiving the standard DBT model of treatment within a state psychiatric hospital. Consequently, the following hypotheses are tested:

1. Individuals receiving DBT services at the LRC will demonstrate significant decreases from the start of treatment to the end of treatment in the number of instances of restraint and seclusion.
2. Individuals receiving DBT services at the LRC will demonstrate significant decreases from the start of treatment to the end of treatment in the number of instances of parasuicidal behaviors.
3. Individuals receiving DBT services at the LRC will demonstrate significant decreases from the start of treatment to the end of treatment in the number of instances of aggressive behavior.
4. Individuals receiving DBT services at the LRC will demonstrate significant decreases from the start of treatment to the end of treatment in the number of PRNs required.

5. Individuals receiving DBT services at the LRC will demonstrate significant increases from the start of treatment to the end of treatment in overall progress ratings for DBT.
6. Individuals receiving DBT services at the LRC will demonstrate significant increases from the start of treatment to the end of treatment in the total percentage of groups and classes they attend.

In addition to the lack of research examining the effects of the standard DBT model implemented in an inpatient setting, no research has been published examining the effects of DBT in conjunction with another treatment approach, such as psychiatric rehabilitation. Psychiatric rehabilitation and DBT both strive to decrease inappropriate behaviors and increase appropriate behaviors; however, the modes of treatment differ between models. DBT stresses the importance of providing a validating treatment environment, whereas psychiatric rehabilitation stresses the importance of reinforcing appropriate behavior while providing as little attention as possible to inappropriate behavior. Consequently, non-dangerous inappropriate behaviors are often ignored, which may further invalidate individuals' thoughts, feelings, and behaviors. There is a chance that these two treatment models could offset, or slow the process, of rehabilitation.

On the other hand, these two treatment models could compliment each other in that DBT provides validation of the individuals' experiences, skills training specifically designed for the difficulties individuals with BPD traits experience, and a specific focus on behavioral patterns contributing to inappropriate behaviors and psychiatric rehabilitation provides increased motivation through immediate consequences for inappropriate behavior and reinforcement of appropriate behaviors. Therefore, the second

purpose of this study is to examine the differences between individuals who received DBT in conjunction with psychiatric rehabilitation (DBT/PR), DBT in conjunction with psychiatric rehabilitation (DBT/PR), DBT in conjunction with treatment as usual (DBT/TAU), and only treatment as usual (TAU) in regards to the number of instances of restraint and seclusion, the number of instances of aggressive behavior, and the number of instances of parasuicidal behavior. The following hypotheses are tested:

1. Instances of restraint and seclusion will decrease faster for those individuals in DBT/ PR than individuals receiving DBT/TAU and only TAU.
2. Instances of aggressive behavior will decrease faster for those individuals in DBT/PR than for those individuals receiving DBT/TAU and only TAU.
3. Instances of parasuicidal behavior will decrease faster for those individuals receiving DBT/PR than for those individuals receiving DBT/TAU and only TAU.
4. The number of PRN medications required will decrease faster for those individuals receiving DBT/PR than those individuals receiving DBT/TAU and only TAU.
5. Progress Ratings for DBT will increase faster for individuals with DBT/PR than for individuals receiving DBT/TAU<sup>1</sup>.
6. Overall group attendance will increase faster for individuals in DBT/PR than for individuals receiving DBT/PR<sup>2</sup>.

<sup>1</sup> Only individuals receiving DBT services have a progress rating for DBT.

<sup>2</sup> Only individuals in Building 10 (DBT/TAU) and Building 14 (DBT/PR) have overall attendance percentages available. Those individuals in Building 3 (TAU) do not have overall attendance percentages.

Finally, due to the lack of research examining factors related to DBT outcome, a number of possible moderating variables are examined. Currently, DBT has demonstrated efficacy with individuals exhibiting solely characteristics of BPD, especially those with high-risk parasuicidal behaviors. However, individuals with BPD characteristics comorbid with other severe Axis I diagnoses, such as schizophrenia spectrum disorders or bipolar disorder, have been excluded from the majority of DBT efficacy studies. In fact, even inpatient DBT studies have excluded individuals with comorbid with severe Axis I disorders. Questions remain regarding the efficacy of treatment for these individuals. Therefore, patient characteristics most often excluded in previous DBT efficacy research are examined as moderating variables in order to determine their effects on treatment. The following hypotheses are examined:

1. Neuropsychological functioning will moderate outcome due to DBT's focus on problem solving.
2. Age will moderate outcome, as studies indicate that as time goes on fewer individuals with a history of BPD continue to meet diagnostic criteria.
3. Number of previous hospitalizations and the number of inpatient days prior to the start of DBT will moderate outcome, as research demonstrates that psychiatric inpatient treatment often reinforces maladaptive behavior and ignores adaptive behavior making behaviors more ingrained and progress taking a longer time.
4. The effect of positive symptoms is exploratory in nature, although still important due to the nature of exclusionary criteria from past research studies.

## CHAPTER 2

## METHOD

## Participants

Participants included all individuals who were discharged from the Lincoln Regional Center who received DBT services from 2001 and later. Participants who received DBT came from the Psychiatric Rehabilitation Program (PR) or a unit providing Treatment as Usual (TAU). The individuals who received DBT/TAU served as a control group for the individuals who received DBT/PR for many of the analyses. Furthermore, a second control group was developed by examining individuals with a diagnosis of BPD who did not receive DBT services and underwent TAU during the same time period and who had a length of stay of 3 months or more. Potential second control group participants were excluded if they received DBT services at the LRC in the past. Table 1 shows the demographic variables for the entire sample population ( $n = 49$ ).

Table 2.1 *Demographic Variables for All Study Participants*

	<i>M(SD)</i>	%
Age	28.97(9.54)	
Education	12.23(2.03)	
# of Previous Hospitalizations	10.70(8.22)	
# of Days in Hospital Prior	88.78(74.89)	
Length of Stay	354.72(229.01)	
Race		
Caucasian		80.6%
African-American		11.1%
Hispanic		2.8%
Other		5.6%
Marital Status		
Single, Never Married		66.7%

Married	19.4%
Divorced	13.9%

### Psychiatric Rehabilitation vs. Treatment as Usual

Those participants who received PR in conjunction with DBT ( $n = 26$ ) underwent treatment focusing on a number of different impairments. These individuals received a variety of treatment modalities in an effort to improve the skills necessary to live successfully in a less restrictive environment. Treatment focused on a number of possible deficit areas typically demonstrated by individuals with severe mental illness, such as grooming and hygiene skills, interpersonal/social skills, work skills, and behavioral self-regulation (Sullivan, Richardson, & Spaulding, 1991). Treatment was provided through contingency management procedures, a variety of groups and classes, individual therapy provided on a case-by-case basis, work opportunities, and regular meetings with treatment team members. All treatment modalities are based upon the individualized treatment plan, which is developed within the first ten days of admission to the unit and continually evolves throughout each participant's stay. Progress of each participant is based upon objective measures collected on a daily, weekly, monthly, and biannually basis. Progress is monitored based on a 30 or 60 day review period, depending on the progress of the individual participant. This program provided intense and individualized treatment to all participants. The goal on this unit was to provide all participants with at least 40 hours of active treatment per week.

Those who received treatment as usual in conjunction with DBT ( $n = 11$ ) received a less intense treatment modality than those who received PR in conjunction with DBT. Treatment as usual is based upon each individual's treatment plan. However, there is a

considerable difference between the number of treatment modalities provided in TAU in comparison to PR. Participants in TAU did not receive as many active treatment hours and their groups and classes are more broadly focused, which stands in stark contrast to the specific focus of the groups and classes provided in PR. Furthermore, contingency management procedures are not generally used in TAU. Instead, the majority of treatment provided on the TAU unit involves psychotropic medications and a few groups and classes that are broadly focused with the goal of including most participants on the unit. The goal of the TAU unit can be described as achieving a level of psychiatric stabilization and then discharging the individual, which is different from PR that focuses on improving deficits required for successful community tenure.

#### Measures

The following measures were included as part of each individual's chart at the LRC: (a) admission and discharge dates to calculate length of stay; (b) discharge location; (c) time in and out of each restraint and seclusion instance to calculate number of hours and the number of instances of restraint and seclusion; (d) the dates and number of PRNs administered; (e) dates of parasuicidal behaviors; (f) dates of aggressive instances; (g) the dates of previous hospitalizations; (h) the medications the person was on at the time of the initial assessment and at the time of discharge; (i) axis I, II, and III diagnoses at the time of admission; (j) ethnicity; (k) marital status; and (l) number of years of education. All of these variables will be collected via the Chart Review Form (see Appendix).

#### *Therapies, Activities, and Classes (TAC) Data*



Attendance for the variety of therapies, activities, and classes (TAC) is monitored, recorded, and used as a standard treatment indicator in psychiatric rehabilitation. The number of scheduled hours provides the amount of active treatment a participant is offered and the attendance percentage provides the amount of active treatment is actually attended by the participant. The goal in PR is to have each patient scheduled for 40 hours per week. The staff member who provided the treatment enters TAC into the TAC computer system weekly. A summary of TAC scores is printed off by clerical staff for each Treatment Plan Review (TPR) meeting that is held for each participant on a 30- or 60-day schedule. Overall TAC scores will be collected from the print out in the charts from those participants in PR prior to 2006 and will be collected from the TAC database from those participants in PR in 2006 and after, and from those participants in TAU who were residing in Building 10 from January 2007 until August 2008.

The Progress Rating for DBT Skills group is entered as part of the TAC system. In addition to attendance, TAC provides a measurement of attention, participation, spontaneity, bizarre behavior, disruptiveness, amount of withdrawal, and overall progress rating for each participant. All individuals in DBT are given TAC scores that are entered into a separate DBT database. This includes individuals who are residing in Building 3 where no TAC system is currently available. The Progress Rating is administered on a scale from 1 (“Demonstrates no interest in class material.”) to 10 (“Has demonstrated the ability to generalize skills into daily living to improve interpersonal relationships, emotion regulation, distress tolerance, and cognitive dysregulation.”) and provides a rating of knowledge, skill acquisition, and interest in DBT class. Progress Ratings are provided for every weekly DBT skills group.

### *Readmission Rate Data*

Information regarding community tenure following discharge was collected via readmission rates from the LRC. The readmission records from the LRC were accessed via the AVATAR system currently in use at the LRC. All participants in the study were identified in the AVATAR system and their dates of readmission were collected for the analyses.

### *Neuropsychological Functioning*

Overall neuropsychological functioning was assessed via the *Neurological Assessment Battery-Screener* (NAB-Screener; Stern & White, 2001). The NAB-Screener was designed to provide a screening of the following neuropsychological domains: Attention, Memory, Language, Spatial Skills, and Executive Functioning, as well as a measure of overall cognitive functioning. Internal consistency for the various subtests ranged from .24 to .86. Test-retest reliability for the various subtests range from .11 to .71. The NAB demonstrates good construct validity, as well as convergent and divergent validity with a number neuropsychological, intelligence, memory, verbal, and attention tests.

### *Symptomatology*

The *Brief Psychiatric Rating Scale* (BPRS; Overall & Gorham, 1962) is a semi-structured interview that assesses psychiatric symptoms. The BPRS was designed to measure symptoms of patients diagnosed with major psychiatric disorders. The BPRS measures the following symptoms: somatic concern, anxiety, emotional withdrawal, conceptual disorganization, guilt, tension, mannerisms and posturing, grandiosity, depression, hostility, suspiciousness, hallucinations, motor retardation,

uncooperativeness, unusual thought content, and blunted affect. Each item is assessed using a 7-point Likert scale from 1 (“Not Present”) to 7 (“Extremely Severe”). Higher scores indicate greater severity of symptoms.

### Procedures

A list of participants in the DBT/PR and DBT/TAU conditions was generated utilizing past DBT records. A list of possible participants was generated from past LRC Building 3 censuses. The diagnoses of female participants who were discharged and have resided in Building 3 from 2001 or later were checked via the psychiatric initial assessment report. Those individuals who received a diagnosis of BPD were included in the control group ( $n = 12$ ). All participants in the study received a number code, which protected confidentiality yet allowed for within-group analyses.

After participants in each group were identified, chart reviews were conducted on all participants. Information regarding demographics and outcome variables was collected. Information was collected for all participants via the Chart Review Form (see Appendix A). The Chart Review Form ensured all possible variables were collected from the chart and decreased the time spent reviewing each file. Data for the predictor analyses was collected from the PR database for the identified individuals. After all data was collected, it was entered into SPSS using client number codes only. The list linking participants to their number codes was subsequently destroyed.

### Statistical Analyses

The first analysis conducted is in regards to the outcome of individuals who have received DBT at the Lincoln Regional Center. The modal discharge location and the average length of stay are reported, as well as the readmission rates at three, six, nine,

twelve, fifteen, and eighteen months after discharge. The number of instances of restraint and seclusion, parasuicidal behavior, aggression, and PRN usage are examined in 3 month intervals and are analyzed using a repeated measures analysis of variance with individual paired *t*-tests if significant differences emerge. An alpha correction is applied to the ANOVA analyses due to the number of outcome variables (6). The alpha is set at 0.008 for all ANOVA analyses.

The second set of analyses conducted is in regards to the differences on outcome between participants receiving DBT and PR, DBT and TAU, and only TAU. The outcome variables include: (a) instances of restraint and seclusion; (b) PRN usage; (c) instances of parasuicidal behavior; (d) instances of aggression. This is analyzed by a mixed factorial general linear model analysis. An alpha correction is utilized due to the number of outcome variables and is set at 0.08. The differences between DBT and PR and DBT and TAU are conducted on overall attendance in groups and classes. This is also analyzed using a mixed factorial general linear model analysis and will include an alpha correction set at 0.008.

The third set of analyses examines possible moderator variables in regards to DBT outcomes. The predictor variables are neuropsychological functioning, symptomatology, number of previous hospitalizations, and age. Only participants in the DBT/PR condition are included in this analysis, as only individuals in this condition completed the neuropsychological and symptomatology assessments as part of the PR program.

## CHAPTER 3

### RESULTS

### Power Analysis

The statistical power of this study was estimated due to the small sample size of 49 participants (26 in the DBT and Rehab condition, 11 in the DBT and TAU condition, and 12 in the TAU only condition). Based upon a conservative effect size of .40, which is consistent with past research examining the differences between standard DBT and TAU (Linehan et al., 1994; Linehan et al., 2006), and a “standard” power estimate of .80 the number of participants needed in the study is 44. Therefore, analyses examining the between-group difference between DBT/PR and DBT/TAU should have sufficient power to detect an effect of .40 or above. Based upon an effect size of 0.25 for within-group pre-post treatment effects of self-injury (Bohus et al., 2000) and a “standard” power estimate of .80 the number of participants needed to detect an effect in the study is 120. There are 37 participants who have completed DBT. Therefore, within-group differences with an effect size of .25, which is consistent with previous research, may not have sufficient statistical power to detect an effect.

### DBT Outcome Data

The first set of analyses concern the outcome of individuals who have received DBT at the Lincoln Regional Center regardless of associated treatment modality (Rehab or Treatment as Usual). The average length of stay for individuals participating in the DBT program was one year ( $M = 365.57$  days;  $SD = 235.25$  days; range = 23 – 1149 days). The average number of inpatient days prior to the start of DBT was approximately 3 months ( $M = 87.68$ ;  $SD = 74.24$ ; range = 0 – 341). The modal discharge location was the short-term care program of the LRC. In other words, 22.2% (8 of 36) of individuals in the DBT program were transferred to the short-term care program instead of being

discharged to community settings. The most common community placements following discharge were to a group home/residential facility (17%), followed by their own apartment (13.9%) and to a supervised apartment (13.9%; see Figure 3.1). In regards to community tenure, at three months 100% of the participants remained out of the hospital, at 6 and 9 months 66.7% of the participants remained out of the hospital, and at 12, 15, and 18 months 50% of participants remained out of the hospital.

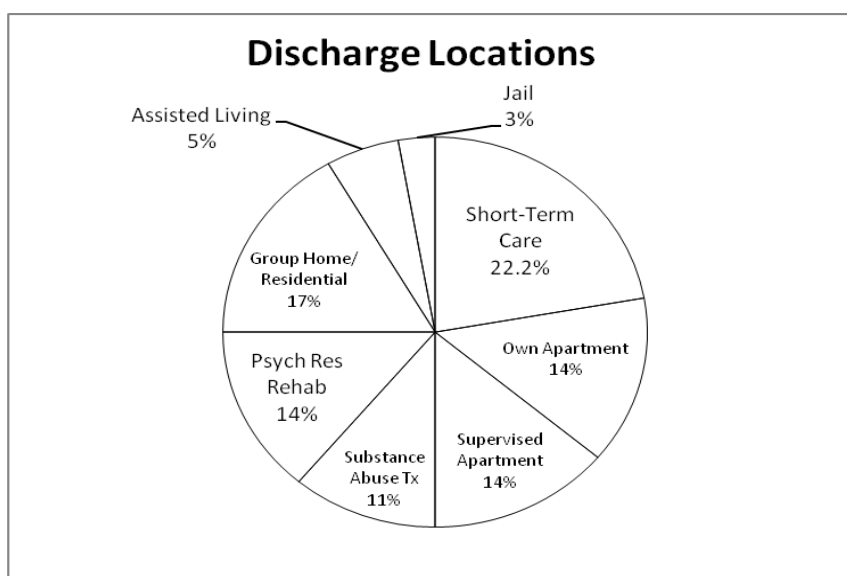


Figure 3.1 Discharge Locations for Individuals Who Received DBT at LRC

The number of instances of restraint and seclusion were analyzed using a repeated-measure ANOVA. Table 3.1 summarizes the listwise data for the number of instances of restraint and seclusion at three months prior to the start of DBT and 3, 6, 9, and 12 months after the start of DBT. Contrary to the hypothesis, there was not a significant difference between the number of instances of restraint and seclusion at each three month time point ( $F(4, 52) = 1.96, p = 0.12, MSE = 0.92$ ). It should be noted that due to the low frequency of restraint and seclusion instances, a floor effect emerged

violating the normal distribution assumption of the ANOVA. Furthermore, due to the nature of the within-groups design and different lengths of stay, there were only 14 individuals included in the analysis with all five time points. Table 3.2 summarizes the data for the number of instances of restraint and seclusion for all individuals at each time point, regardless of whether or not they had data points for every time point. Figure 3.2 summarizes the trend of the data over time.

Table 3.1 *Listwise Means and Standard Deviations of Restraint and Seclusion Instances at Each Time Period*

	Time Period				
	3 Months Prior	3 Months	6 Months	9 Months	12 Months
Mean	1.00	1.36	0.43	0.64	0.71
Standard Deviation	1.52	2.95	1.16	1.65	1.64

Table 3.2 *Means and Standard Deviations of Restraint and Seclusion Instances at Each Time Period*

Time Period	Mean	Standard Deviation	<i>n</i>
3 months prior	2.54	4.61	28
3 months	2.54	5.21	33
6 months	0.27	0.94	22
9 months	1.74	3.14	19
12 months	0.88	1.62	17

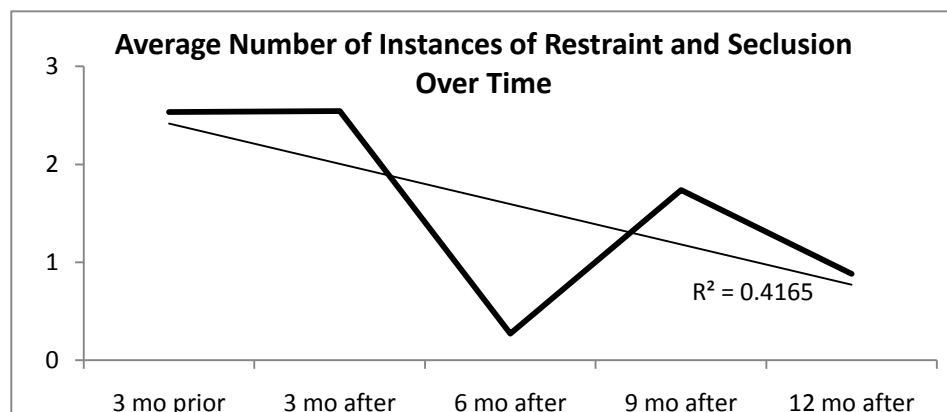


Figure 3.2 Trend of Restraint and Seclusion Instances Over Time

The number of aggressive instances was analyzed using a repeated-measure ANOVA. Table 3.3 summarizes the listwise data for the number of aggressive instances at 3 months prior to the start of DBT and 3, 6, 9, and 12 months after the start of DBT. Contrary to the hypothesis, there was not a significant difference between time periods for the number of aggressive instances ( $F(4, 56) = 1.34, p = 0.27, MSE = 3.05$ ). It should be noted that due to the low frequency of aggressive instances, a floor effect emerged violating the normal distribution assumption of the ANOVA. Furthermore, due to the nature of the within-groups design and different lengths of stay, there were only 15 individuals included in the analysis with all five time points. Table 3.4 summarizes the data for the number of aggressive instances for all individuals at each time point, regardless of whether or not they had data points for every time point. Figure 3.3 summarizes the trend of the data over time.

Table 3.3 *Listwise Means and Standard Deviations of Aggressive Instances at Each Time Period*



	Time Period				
	3 Months Prior	3 Months	6 Months	9 Months	12 Months
Mean	1.53	2.20	1.47	1.13	0.80
Standard Deviation	2.92	4.62	4.17	2.47	1.61

Table 3.4 Means and Standard Deviations of Aggressive Instances at Each Time Period

Time Period	Mean	Standard Deviation	<i>n</i>
3 months prior	1.61	3.07	28
3 months	1.88	4.05	32
6 months	1.08	3.39	24
9 months	1.53	2.89	19
12 months	0.76	1.52	17

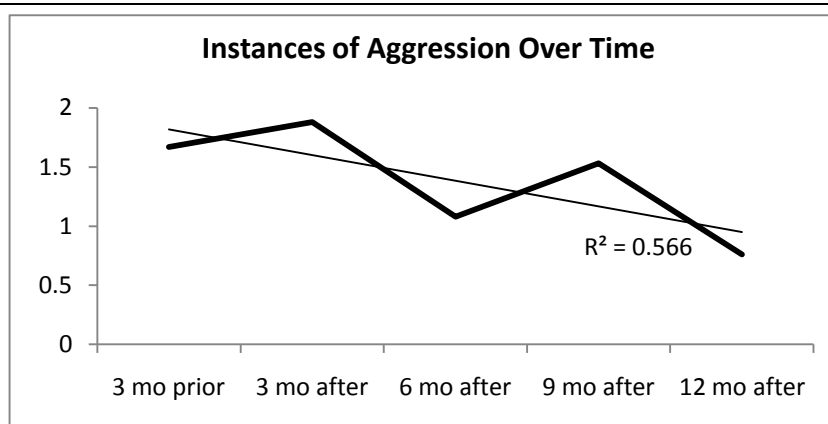


Figure 3.3 Trend of Aggressive Instances Over Time

The number of self-harm instances was analyzed using a repeated-measure ANOVA. Table 3.5 summarizes the listwise data for the number of self-harm instances at 3 months prior to the start of DBT and 3, 6, 9, and 12 months after the start of DBT. Contrary to the hypothesis, there was not a significant difference between time periods for the number of self-harm instances ( $F(4, 56) = 1.22, p = 0.31, MSE = 0.07$ ). It should be noted that due to the low frequency of self-harm instances, a floor effect emerged violating the normal distribution assumption of the ANOVA. Furthermore, due to the

nature of the within-groups design and different lengths of stay, there were only 15 individuals included in the analysis with all five time points. Table 3.6 summarizes the data for the number of self-harm instances for all individuals at each time point, regardless of whether or not they had data points for every time point. Figure 3.4 summarizes the trend of the data over time.

Table 3.5 *Listwise Means and Standard Deviations of Self-harm Instances at Each Time Period*

	Time Period				
	3 Months Prior	3 Months	6 Months	9 Months	12 Months
Mean	0.13	0.13	0	0	0
SD	0.35	0.52	0	0	0

Table 3.6 *Means and Standard Deviations of Self-harm Instances at Each Time Period*

Time Period	Mean	Standard Deviation	<i>n</i>
3 months prior	0.93	2.64	28
3 months after DBT start	0.75	2.26	32
6 months after DBT start	0.13	0.61	24
9 months after DBT start	0.05	0.23	19
12 months after DBT start	0.12	0.49	17

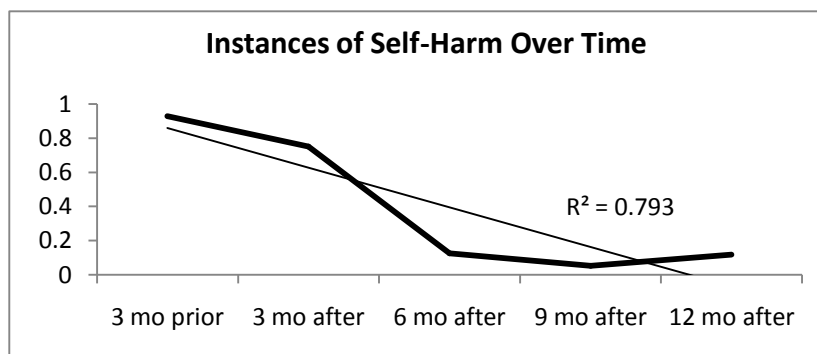


Figure 3.4 Trend of Self-harm Instances Over Time

The number of PRN medications resulted in a skewed distribution, so the data was windsorized to correct for outliers that may influence the data. After the data was cleaned, a repeated-measure ANOVA was used to analyze the data. Table 3.7 summarizes the average number of PRN medications administered over time. There was a significant difference among the number of PRN medications administered at the five different time points ( $F(4, 136) = 16.79, p < .05, MSE = 132.04$ ). Pairwise comparisons using LSD (with a minimum mean difference = 6.54) revealed that, consistent with the research hypothesis, on average more PRN medications were taken in the three months prior to DBT than at 3, 6, 9, or 12 months. However, contrary to the research hypothesis there was not a significant difference between 3 months and 6, 9, or 12 months, between 6 months and 9 or 12 months, or between 9 months and 12 months. Only two individuals were lost due to not having data points at every time period for this analysis. Figure 3.5 shows the trend of the average number of PRN medications taken over time.

Table 3.7 Listwise Means and Standard Deviations of PRN Medications Administered at Each Time Period

	Time Period				
	3 Months Prior	3 Months	6 Months	9 Months	12 Months
Mean	24.87	7.63	11.11	7.56	4.83
Standard Deviation	26.87	8.88	11.90	6.73	3.51

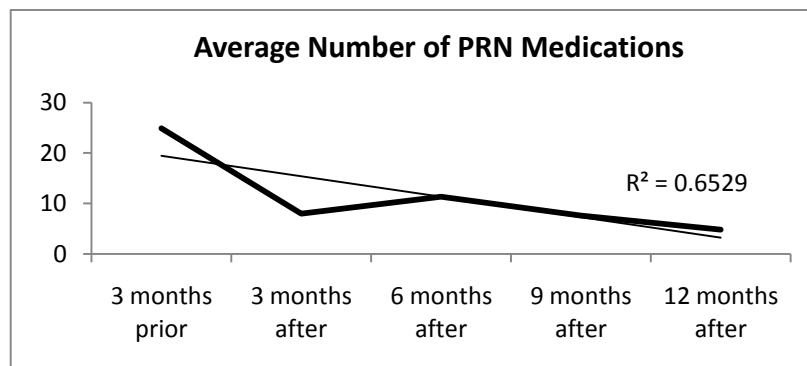


Figure 3.5 Average Number of PRN Medications Administered At Each Time Period

The average Treatment, Activities, and Classes (TAC) scores were analyzed in three month intervals using a repeated-measures analysis of variance. The average TAC scores resulted in a skewed distribution, so the data was windsorized to correct the distribution. After the data was cleaned, the repeated measures analysis of variance was completed. Table 3.8 summarizes the listwise average TAC scores taken over time. There was not a significant difference among the distributions of the four time points ( $F(4, 39) = 0.56, p = .692, MSE = 10.73$ ). Due to the nature of the within-groups design and different lengths of stay, there were only 14 individuals included in the analysis with all five time points. Table 3.9 summarizes the data for the average TAC scores for all individuals at each time point, regardless of whether or not they had data points for every time point. Figure 3.6 shows the trend of TAC scores over time for all individuals.

Table 3.8 *Listwise Mean and Standard Deviations for the Average TAC Scores at Each Time Period*

	Time Period				
	3 Months Prior	3 Months	6 Months	9 Months	12 Months
Mean	94.43	95.80	96.13	95.47	95.79
Standard Deviation	4.29	4.78	4.40	4.94	4.49

Table 3.9 *Means and Standard Deviations of TAC Scores at Each Time Period*

Time Period	Mean	Standard Deviation	<i>n</i>
3 months prior	93.78	4.82	26
3 months after DBT start	94.81	5.01	28
6 months after DBT start	95.76	4.57	22
9 months after DBT start	95.37	4.89	18
12 months after DBT start	95.79	4.49	14

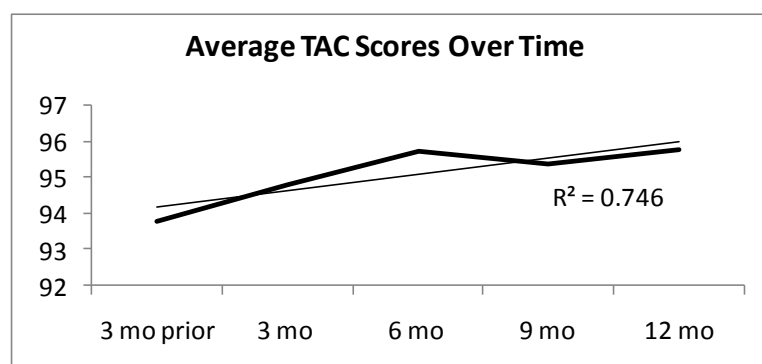


Figure 3.6. Average TAC Scores at Each Time Period

The average DBT TAC scores were analyzed in three month intervals using a repeated-measure ANOVA. The average DBT TAC scores resulted in a skewed distribution, so the data was windsorized to correct the distribution. After the data was cleaned and the data was no longer skewed, the repeated measures analysis of variance

was completed. Table 3.10 summarizes the listwise average DBT TAC scores taken over time. There was not a significant difference among the distributions of the four time points ( $F(3, 24) = 1.53, p = .23, MSE = 1.13$ ). Due to the nature of the within-groups design and different lengths of stay, there were only nine individuals included in the analysis with all five time points. Table 3.11 summarizes the data for the average TAC scores for all individuals at each time point, regardless of whether or not they had data points for every time point. Figure 3.7 shows the trend of TAC scores over time for all individuals.

Table 3.10 *Listwise Mean and Standard Deviations for the Average DBT TAC Scores at Each Time Period*

	Time Period			
	3 months	6 months	9 months	12 months
Mean	6.16	5.92	6.88	6.00
Standard Deviation	1.45	1.67	1.28	2.14

Table 3.11 *Means and Standard Deviations of DBT TAC Scores at Each Time Period*

Time Period	Mean	Standard Deviation	<i>n</i>
3 months	5.67	1.34	18
6 months	6.27	1.64	16
9 months	6.77	1.26	14
12 months	6.27	2.01	11

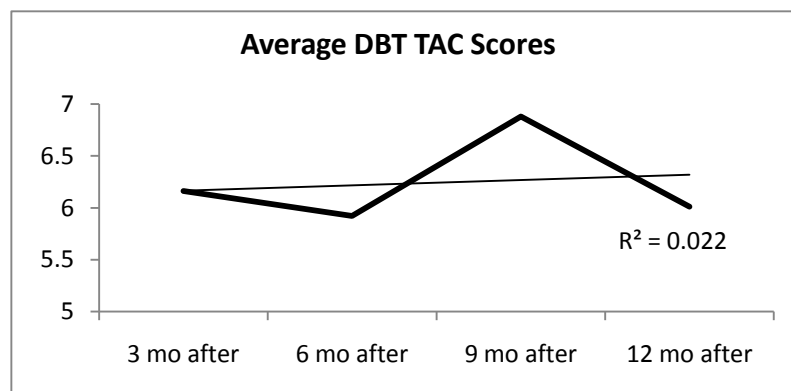


Figure 3.7 Trend of Average DBT TAC Scores Over Time

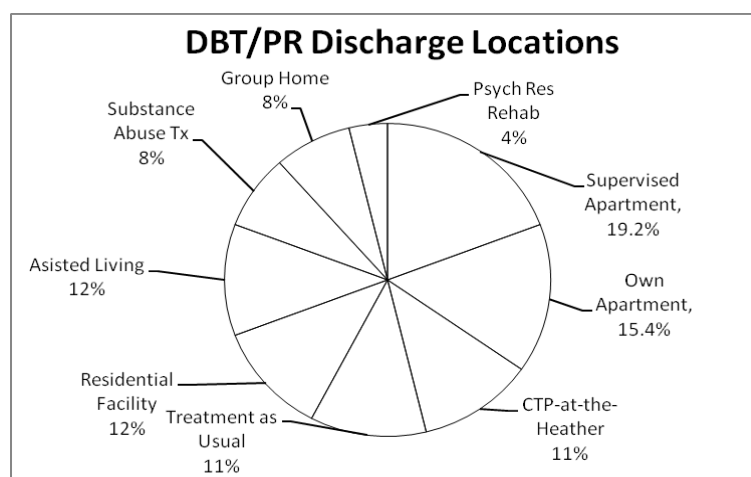
#### DBT Outcome Data by Treatment Modality

The second set of analyses conducted was in regards to the differences on outcome between participants receiving DBT and PR, DBT and TAU, and only TAU. The demographic information for each condition is shown in Table 3.12. The discharge locations for each treatment modality are shown in Figure 3.8. Supervised apartments were the modal discharge location for DBT and PR (19.2%), Short-Term Care was the modal common discharge location for DBT and TAU (50%), and assisted living was the modal discharge location for TAU (25%). In regards to community tenure, at one year 44% of individuals in the TAU group were readmitted, 28.6% of individuals in the DBT/TAU group were readmitted, and 8% of individuals in the DBT/PR group were readmitted, while at 18 months 75% of individuals in the TAU group were readmitted, 33% of individuals in the DBT/TAU group were readmitted, and 13% of individuals in the DBT/PR group were readmitted. See Figure 3.9 for readmission rates at all time periods for all three conditions.

Table 3.12 *Demographic Information by Treatment Condition.*

	DBT/PR	DBT/TAU	TAU
--	--------	---------	-----

Age	31.23(9.12)	25.64(4.41)	30.82(15.20)
Education	12.31(2.00)	12.10(2.13)	12.58(2.57)
# of Prev.	10.96(9.45)	9.30(4.06)	7.25(6.18)
Hospitalizations			
# of Days in Hospital	99.00(80.52)	60.91(50.10)	0
Prior	440.27(227.73)	178.73(148.40)	107.00(45.72)
Length of Stay			
Race	88.5%	63.6%	83.3%
Caucasian	7.7%	18.2%	8.3%
African-American	3.8%	0%	0%
Hispanic	0%	18.2%	8.3%
Other			
Marital Status	61.5%	81.8%	91.7%
Single, Never	26.9%	0%	0%
Married	11.5%	18.2%	8.3%
Married			
Divorced			





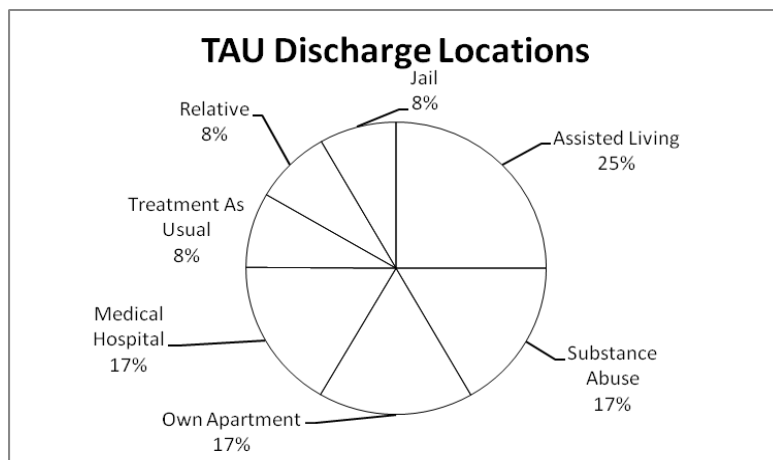
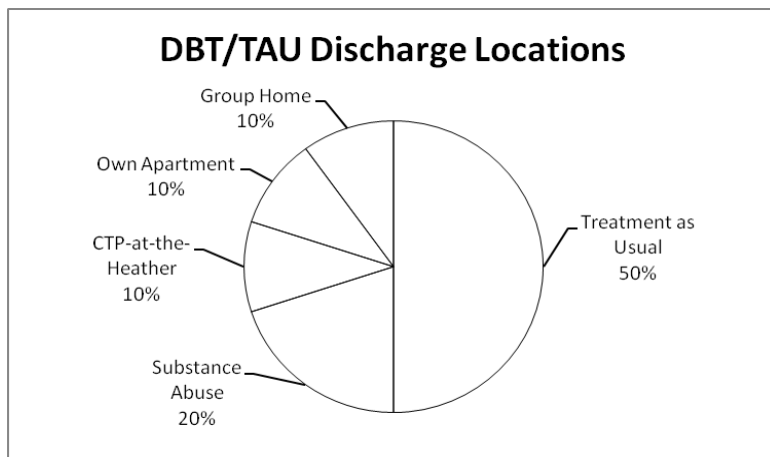
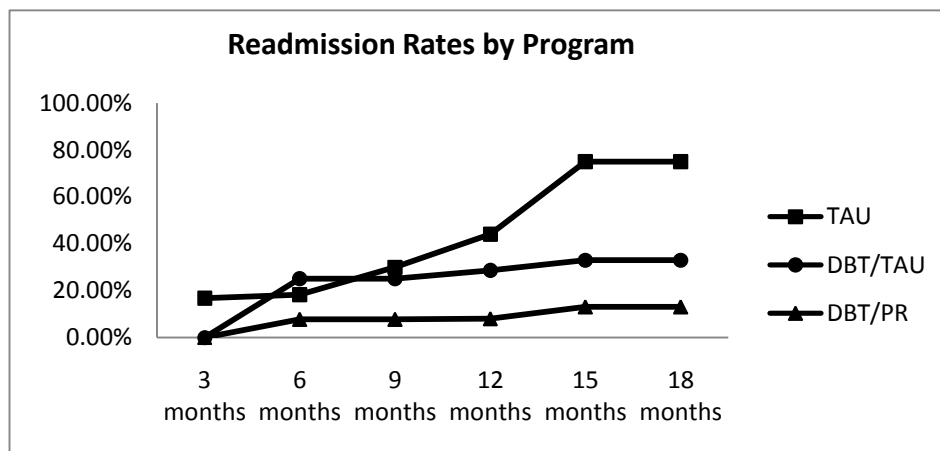


Figure 3.8 Discharge Locations by Treatment Modality



*Figure 3.9 Readmission rates by program*

The number of instances of restraint and seclusion was analyzed using a mixed factorial ANOVA. The follow-up analyses were performed using the LSD procedure ( $p = .05$ ) to examine the effects of treatment modality and time period upon the number of restraint and seclusion instances. Table 3.13 shows the means for each condition design of the design. There was not an interaction of treatment modality and time period as they relate to the number of instances of restraint and seclusion ( $F(4, 84) = 2.61, p < 0.04, MSE = 2.576$ ). There was not a main effect for program ( $F(2, 42) = 0.89, p = 0.42, MSE = 8.31$ ) or for time period ( $F(2, 84) = 1.27, p = 2.85, MSE = 2.57$ ). Figure 3.10 shows the pattern of the number of restraint and seclusion instances over time by treatment modality.

Table 3.13 *Means and Standard Deviations for Treatment Modality and Time Period for Restraint and Seclusion Instances*

Program		Time Period					
		1 month		2 months		3 months	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
DBT/PR	( <i>n</i> = 26)	0.77	2.42	0.65	2.19	0.46	1.21
DBT/TAU	( <i>n</i> = 8)	1.13	2.10	1.13	2.42	2.13	2.80
TAU	( <i>n</i> = 11)	2.36	3.47	0.82	1.67	0.18	0.40

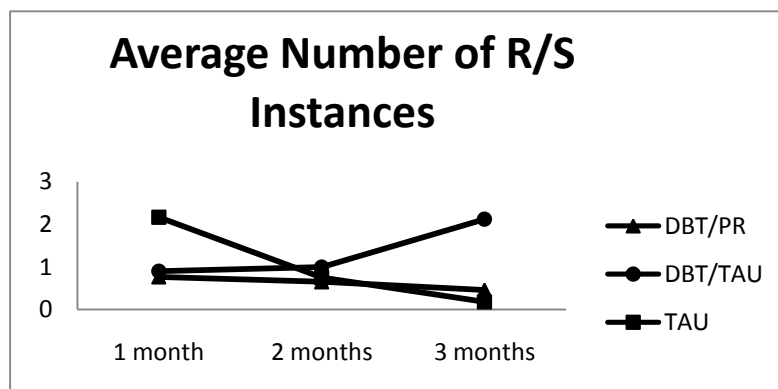


Figure 3.10 Instances of Restraint and Seclusion for Treatment Modality by Time Period

Only three months of data was analyzed for the three groups because the average length of stay for individuals in the TAU group was approximately three months ( $M = 107$ ,  $SD = 13.2$ ). However, the length of stay in the DBT/TAU and the DBT/PR were longer, with an average of six months ( $M = 178.73$ ,  $SD = 44.74$ ) and over one year ( $M = 440.27$ ,  $SD = 44.66$ ), respectively. Therefore, the pattern of data for the DBT/PR and the DBT/TAU groups was also analyzed over 12 months in order to gain a better understanding of the progress made over one year instead of only three months. Figure 3.11 shows the pattern of data for the DBT/PR and DBT/TAU groups over twelve months.

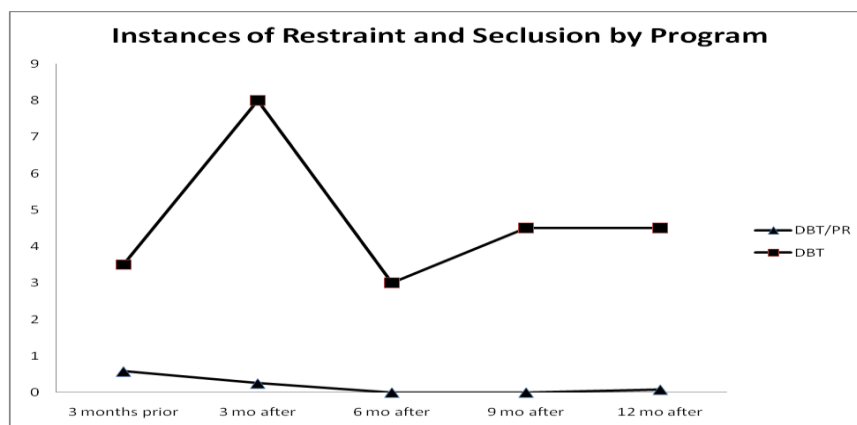


Figure 3.11 Instances of Restraint and Seclusion for DBT/PR and DBT/TAU by Time Period

The number of aggressive instances was analyzed using a mixed factorial ANOVA. The follow-up analyses were performed using the LSD procedure ( $p = .05$ ) to examine the effects of treatment modality and time period upon the number of aggressive instances. Table 3.14 shows the means for each condition design of the design. There was not a significant interaction for treatment modality and time as they relate to the number of aggressive instances ( $F(4, 80) = 1.30, p = 0.28, MSE = 2.08$ ). There were also no significant main effects for time period ( $F(2, 80) = 1.18, p = 0.31, MSE = 2.08$ ) or treatment modality ( $F(2, 40) = 1.56, p = 0.22, MSE = 4.72$ ). Figure 3.12 shows the pattern of aggressive instances over time by treatment modality.

Much like the number of instances of restraint and seclusion, only three months of data was analyzed for the three groups because the average length of stay for individuals in the TAU was only approximately three months. However, the pattern of data for the DBT/PR and the DBT/TAU groups was analyzed over 12 months in order to gain a better understanding of the progress made over one year instead of only three months. Figure

3.13 shows the pattern of data for the DBT/PR and DBT/TAU groups over twelve months.

Table 3.14 Means and Standard Deviations for Treatment Modality and Time Period for Aggressive Instances

Program	Time Period					
	1 month		2 months		3 months	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
DBT/PR ( <i>n</i> = 26)	0.52	2.22	0.28	1.02	0.40	1.15
DBT/TAU ( <i>n</i> = 8)	1.13	2.10	1.13	2.42	1.50	0.42
TAU ( <i>n</i> = 10)	1.80	2.27	0.60	0.97	0.20	0.42

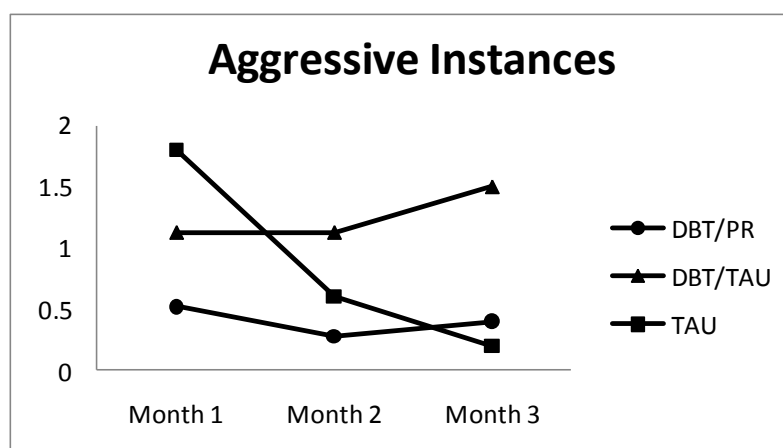


Figure 3.12 Pattern of Aggressive Instances Over Time by Treatment Modality

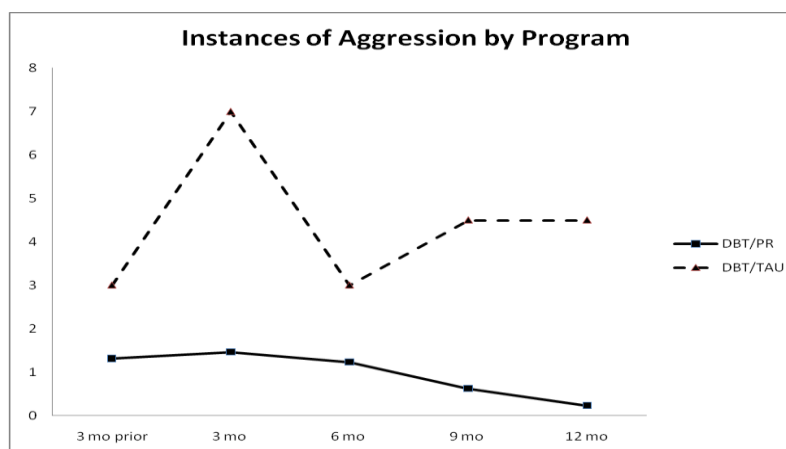


Figure 3.13 Instances of Aggression for DBT/PR and DBT/TAU by Time Period

The number of self-harm instances was analyzed using a mixed factorial ANOVA. The follow-up analyses were performed using the LSD procedure ( $p = .05$ ) to examine the effects of treatment modality and time period upon the number of self-harm instances. Table 3.15 shows the means for each condition design of the design. There was not a significant interaction for treatment modality and time as they relate to the number of self-harm instances ( $F(4, 80) = 1.67, p = 0.17, MSE = 0.88$ ). There were also no significant main effects for time period ( $F(2, 80) = 0.21, p = 0.82, MSE = 0.88$ ) or treatment modality ( $F(2, 40) = 0.12, p = 0.89, MSE = 1.71$ ). Figure 3.14 shows the pattern of aggressive instances over time by treatment modality.

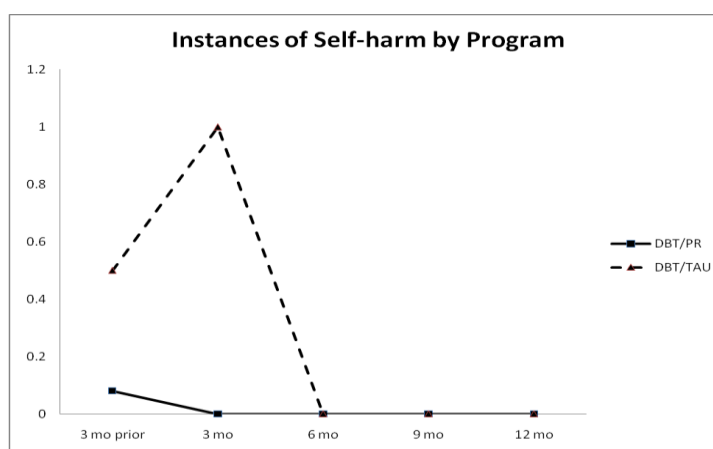
Table 3.15 Means and Standard Deviations for Treatment Modality and Time Period for Self-harm Instances

Program	Time Period					
	1 month		2 months		3 months	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
DBT/PR ( $n = 25$ )	0.28	1.21	0.40	1.63	0.80	0.28
DBT/TAU ( $n = 8$ )	0.00	0.00	0.00	0.00	0.63	1.19
TAU ( $n = 10$ )	0.80	1.62	0.30	0.67	0.00	0.00



Figure 3.14 Pattern of Self-harm Instances Over Time by Treatment Modality

Much like the other outcome measures, only three months of data was analyzed for the three groups because the average length of stay for individuals in the TAU was only approximately three months. However, the pattern of data for the DBT/PR and the DBT/TAU groups was analyzed over 12 months in order to gain a better understanding of the progress made over one year instead of only three months. Figure 3.15 shows the pattern of data for the DBT/PR and DBT/TAU groups over twelve months.



*Figure 3.15* Instances of Parasuicidal Behavior for DBT/PR and DBT/TAU by Time Period

The number of PRN medications resulted in a skewed distribution, so the data were windsorized to correct for outliers that may influence the data. After the data was cleaned, a mixed factorial ANOVA was performed. The follow-up analyses were performed using the LSD procedure ( $p = .05$ ) to examine the effects of treatment modality and time period upon the number of PRN medications administered. Table 3.16 shows the means for each condition design of the design. There was not a significant interaction for treatment modality and time as they relate to the number of PRN medications administered ( $F(4, 82) = 0.69, p = 0.60, MSE = 15.747$ ). There was a not

main effect for time period ( $F(2, 82) = 4.24, p = 0.02, MSE = 66.82$ ). There was a main effect for treatment modality ( $F(2, 41) = 6.32, p < 0.001, MSE = 38.02$ ) where DBT/PR had fewer PRN medications administered in comparison to DBT/TAU and TAU.

However, this pattern was not descriptive for any of the conditions and is misleading as a general description of the effect. Instead, at month one and two DBT/PR had fewer PRN medications administered than both DBT/TAU and the TAU condition, while at month three there were no significant differences. Figure 3.16 shows the pattern of PRN medications administered over time by treatment modality.

Table 3.16 Means and Standard Deviations for Treatment Modality and Time Period for PRN Medications Administered

Program		Time Period					
		1 month		2 months		3 months	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
DBT/PR	( <i>n</i> = 25)	2.12	5.52	1.56	3.59	1.20	2.55
DBT/TAU	( <i>n</i> = 8)	7.75	8.45	5.75	4.76	4.06	5.00
TAU	( <i>n</i> = 11)	7.27	6.75	4.45	4.69	3.75	3.79

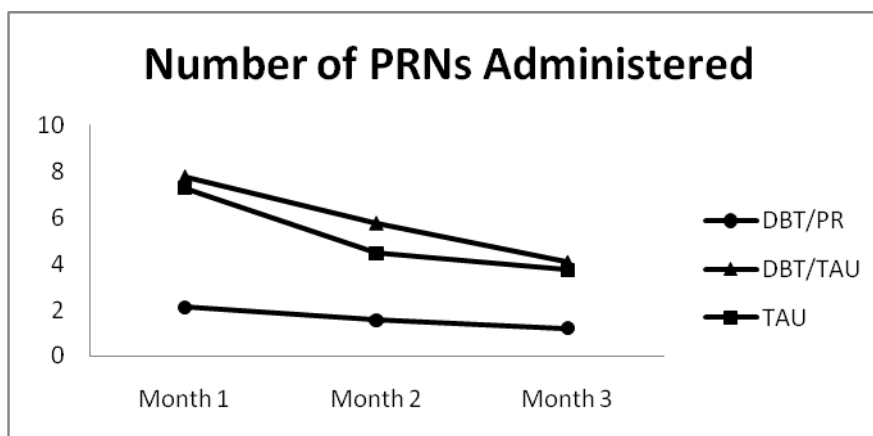


Figure 3.16 Pattern of PRN Medications Administered Over Time by Treatment Modality



Much like the other outcome measures, only three months of data was analyzed for the three groups because the average length of stay for individuals in the TAU was only approximately three months. However, the pattern of data for the DBT/PR and the DBT/TAU groups was analyzed over 12 months in order to gain a better understanding of the progress made over one year instead of only three months. Figure 3.17 shows the pattern of data for the DBT/PR and DBT/TAU groups over twelve months.

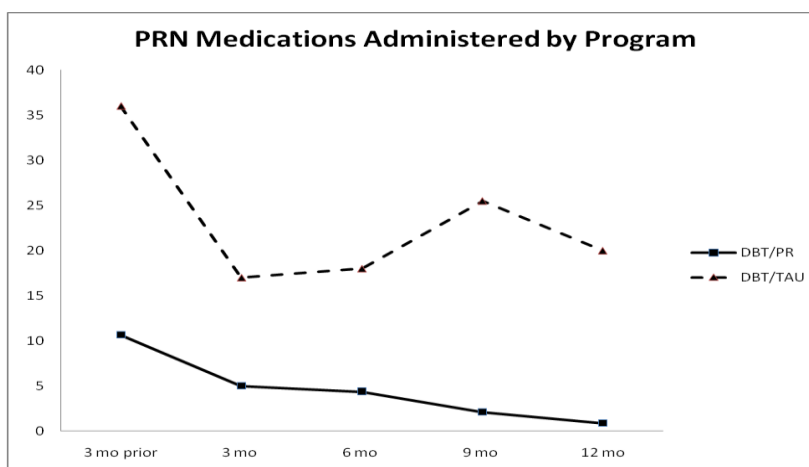


Figure 3.17 The Number of PRN Medications Administered for DBT/PR and DBT/TAU by Time Period

The average Treatment, Activities, and Classes (TAC) scores were analyzed using a mixed factorial ANOVA. The follow-up analyses were performed using the LSD procedure ( $p = .05$ ) to examine the effects of treatment modality and time period upon the number of self-harm instances. Table 3.17 shows the means for each condition design of the design. There was a significant interaction of treatment modality and time period as they relate to TAC scores ( $F(2, 52) = 10.41, p < .001, MSE = 35.864$ ), with the DBT/TAU group having lower scores across time than the DBT/PR group (LSD

minimum mean difference = 5.58). There was a main effect of time period ( $F(2, 52) = 13.79, p < .001, MSE = 35.864$ ), with better scores at month two and three than at time one (LSD minimum mean difference = 3.22). However, this pattern was only descriptive for the DBT/TAU group, so is misleading as a general description of the effect. There was also a main effect for treatment modality ( $F(1, 26) = 9.65, p < .01, MSE = 315.96$ ), with DBT/PR having higher scores than DBT/TAU. This pattern holds for all time periods, so is descriptive as a general statement of this effect. Figure 3.18 shows the pattern of average TAC scores over time by treatment modality.

Table 3.17 Means and Standard Deviations for Treatment Modality and Time Period for TAC Scores.

Program		Time Period					
		1 month		2 months		3 months	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
DBT/PR	( <i>n</i> = 22)	92.30	11.76	93.78	9.60	93.31	10.41
DBT/TAU	( <i>n</i> = 6)	67.54	15.90	82.39	11.72	85.41	11.52

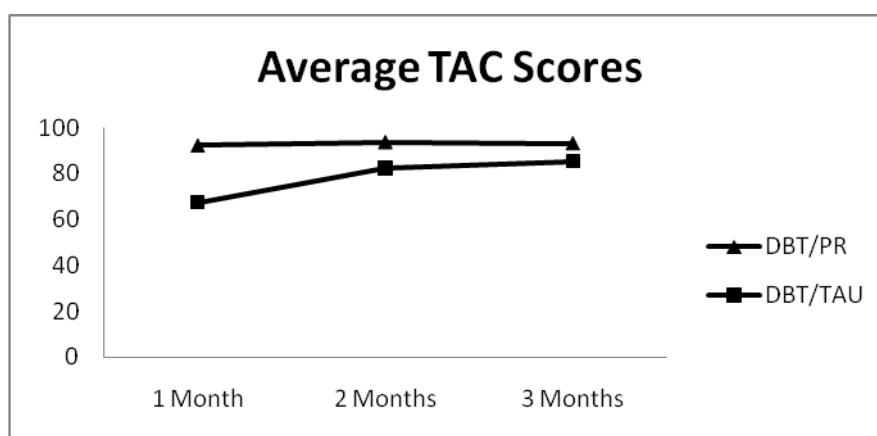


Figure 3.18 Pattern of Average TAC Scores Over Time by Treatment Modality

Much like the other outcome measures, only three months of data was analyzed for the three groups because the average length of stay for individuals in the TAU was only approximately three months. However, the pattern of data for the DBT/PR and the DBT/TAU groups was analyzed over 12 months in order to gain a better understanding of the progress made over one year instead of only three months. Figure 3.19 shows the pattern of data for the DBT/PR and DBT/TAU groups over twelve months.

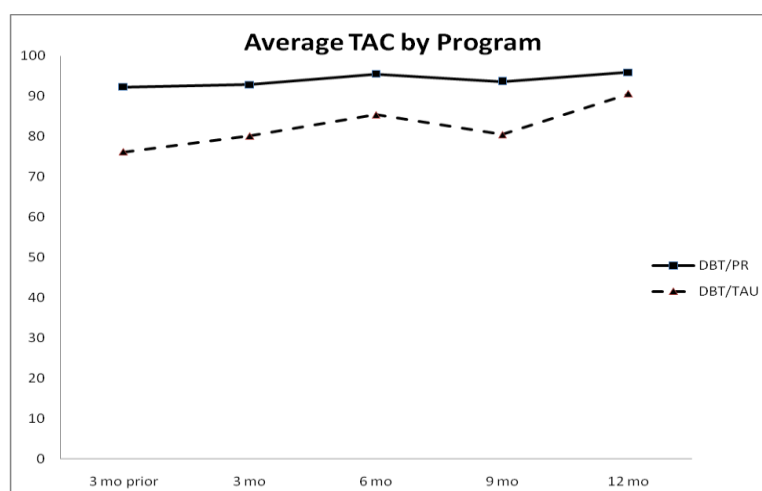


Figure 3.19 The Average TAC scores for DBT/PR and DBT/TAU by Time Period

### Moderating Variables

The third set of analyses examines possible moderator variables in regards to DBT outcomes. The predictor variables are neuropsychological functioning, symptomatology assessed by the Brief Psychiatric Rating Scale (BPRS), number of previous hospitalizations, number of inpatient days in the year prior to starting DBT, and age at admission to the PR program. The BPRS subscale of most concern is the Thinking Disorder subscale (composed of the following items: Grandiosity, Hallucinations, Unusual Thought Content, Conceptual Disorganization, and Bizarre Behavior) because it

specifically examines positive symptoms. Only participants in the DBT/PR condition are included in the analyses, as only individuals in this condition completed the neuropsychological and symptomatology assessments as part of the PR program.

Due to the low number of participants with symptomatology scores and neuropsychological scores, regression analyses could not be performed. Therefore, specific cases are examined in order to determine if DBT is beneficial for these individuals with high symptomatology and low neuropsychological scores, as previous research has excluded these individuals from DBT outcome studies. However, because almost all of the individuals in the DBT/PR condition had data points for age at admission, number of previous hospitalizations, and number of inpatient days in the previous year, the relationship between these variables and the criterion variables is examined in correlational analyses.

Prior to the correlational analyses, all variables were winsorized to correct for outliers that may influence the data. After the data was examined for outliers, the skewness of the distribution for each variable was examined. If needed, the data was transformed in order to correct for the skewness and aid the data in forming as close to a normal distribution as possible. The number of previous hospitalizations required both winsorizing and a square root transformation, while age and number of inpatient days in the previous year only required winsorizing.

Table 3.18 shows the correlational matrix for age at admission, number of previous hospitalizations, and the number of inpatient days in the previous year with the six criterion variables. Age at admission and the number of days in an inpatient setting prior to the start of the DBT/PR program were not significantly correlated with any of the

criterion variables. However, the number of previous hospitalizations had a significant positive correlation with the number of instances of self-harm ( $r = .61, p < .05, n = 14$ ), indicating that a higher number of previous hospitalizations is associated with a higher number of self-harm instances at one year. Furthermore, the number of previous hospitalizations had a significant negative correlation with average TAC scores ( $r = -.78, p < .01, n = 12$ ), indicating that a higher number of previous hospitalizations is associated with lower TAC scores at one year.

Table 3.18 *Correlation Matrix of Demographic Predictor Variables and Criterion Variables at One Year*

Predictor Variable	Time Period					
	R/S	Agg	Self-Harm	PRN	TAC	DBT TAC
Age at Admission	-.18	-.25	-.03	.16	.23	.13
# Prev. Hosp.	.41	.10	.61*	-.17	-.78**	-.08
Inpt Days Prev Yr	-.48	-.44	-.34	.12	.24	.32

\* Correlations  $p < .05$ . \*\* Correlations  $p < .001$ .

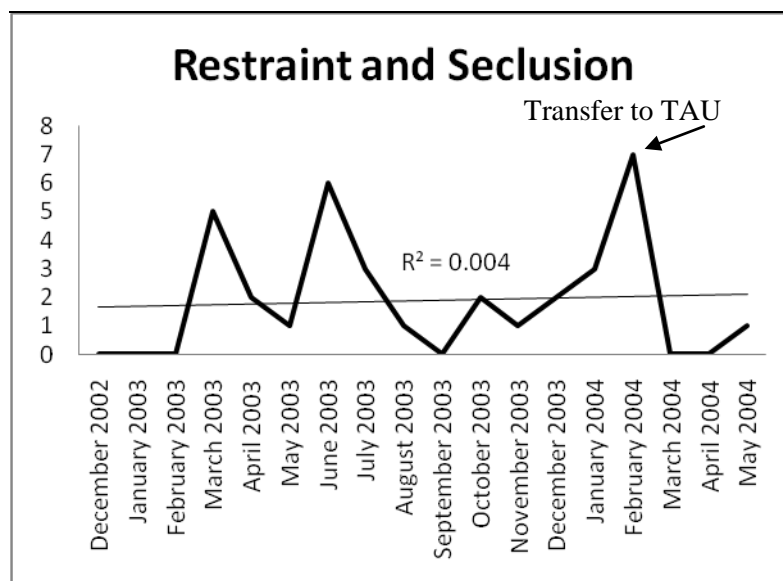
In order to compare the efficacy of the DBT/PR for individuals with differing neuropsychological scores, the data was examined for individuals with average neuropsychological scores and individuals with scores one and two standard deviations below the mean. Once these individuals were identified, an individual from each score category was matched as closely as possible with the number of previous hospitalizations and the number of days in the hospital prior to entering the DBT/PR program. These matching variables were utilized because the number of previous hospitalizations had the greatest association with outcome variables, followed by the number of days in the

hospital prior to entering the DBT/PR program (although these correlations were not significant, they did have medium effect sizes). This resulted in two matched groups and one matched pair, one matched group was in the top 75% of previous hospitalizations, one matched group was in the middle 50% of previous hospitalizations, and the matched pair were in the bottom 25% of previous hospitalizations. Each matched group had one individual assessed in the “impaired” (2 standard deviations below the mean) range of neuropsychological functioning, one individual assessed in the “below average” (1 standard deviation below the mean), and one individual in the “average” range of neuropsychological functioning, while the matched pair had one individual in the “impaired” range and one in the “below average” range (there was not an individual in the “average” range in the bottom 25% of previous hospitalizations).

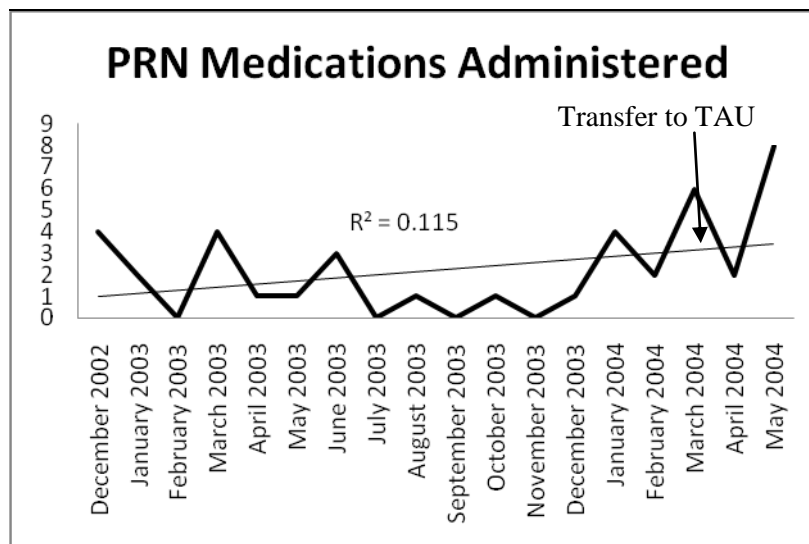
Two out of the three matched groups differed by no more than three previous hospitalizations. One of the matched groups differed by 21 previous hospitalizations, but all three individuals were in the top 75% on number of hospitalizations. Due to the low number of individuals in the study and the extreme scores of two of the three participants in the group, it was impossible to match the group within two previous hospitalizations. Furthermore, due to the low number of individuals in the study, matching the number of inpatient days in the previous year was more difficult. Two out of the three matched pairs differed by no more than 110 days, while the other matched pair differed by 153 days. More weight was given to the number of previous hospitalizations because they had the greatest correlation with outcome.

The first matched group examined included those individuals in the top 75% in previous hospitalizations. The individual in the “impaired” range on neuropsychological

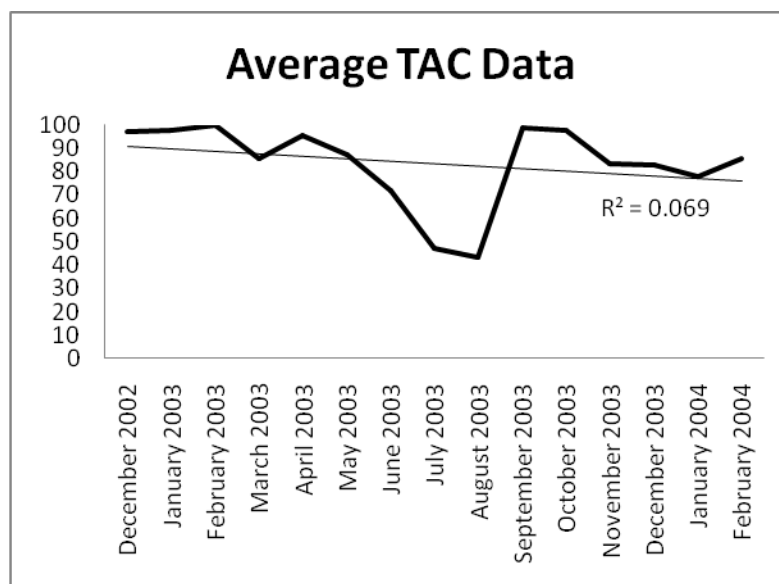
functioning had 35 previous hospitalizations and came directly to the DBT/PR program, so she did not have any days in the hospital prior to the DBT/PR program. She was in the DBT program for 14 months and she transferred to treatment as usual (TAU) after 15 months in the PR program. Her data patterns on the outcome variables are presented below in Figures 3.20, 3.21, 3.22, and 3.23. The data indicate no change in the number of instances of restraint and seclusion over time, although the peaks in the data appear to be increasing in the number of instances. The data indicate a slight increase in the number of PRN medications administered over time. The data indicate a slight decrease in the average TAC data during her time in DBT/PR and the average DBT TAC data indicate no change.



*Figure 3.20* Average Number of Restraint and Seclusion Instances Over the Course of Treatment for “Impaired” Neuropsychological Functioning and Top 75% in Previous Hospitalizations

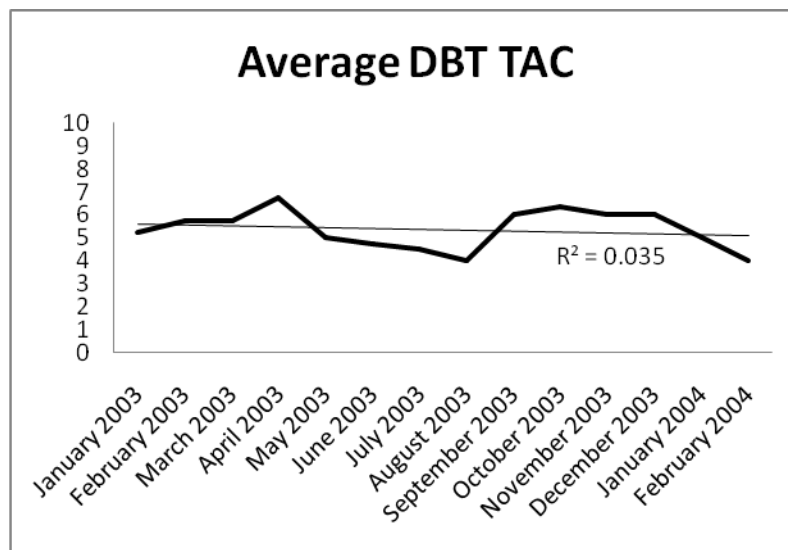


*Figure 3.21* Average Number of PRN Medications Administered per Month Over the Course of Treatment for “Impaired” Neuropsychological Functioning and Top 75% of Previous Hospitalizations



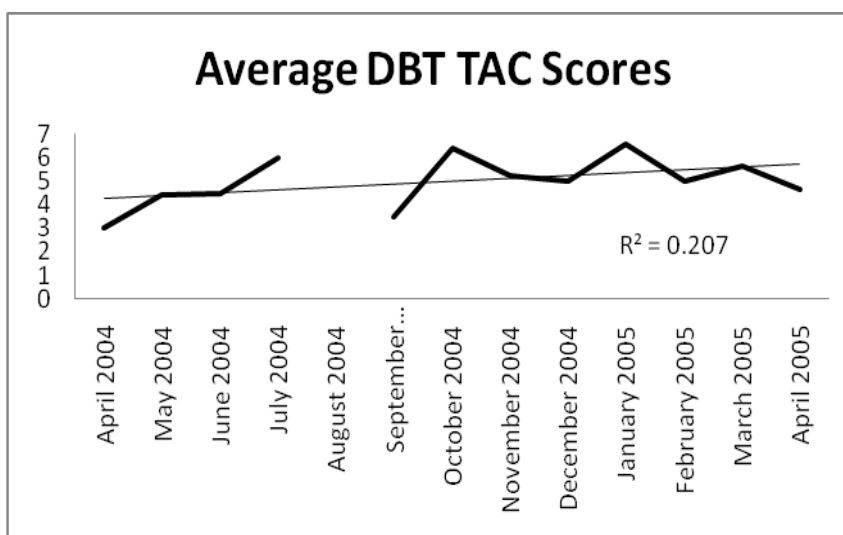
*Figure 3.22* Average TAC Scores Over Time in the Rehabilitation and DBT Program for “Impaired” Neuropsychological Functioning and Top 75% of Previous Hospitalizations





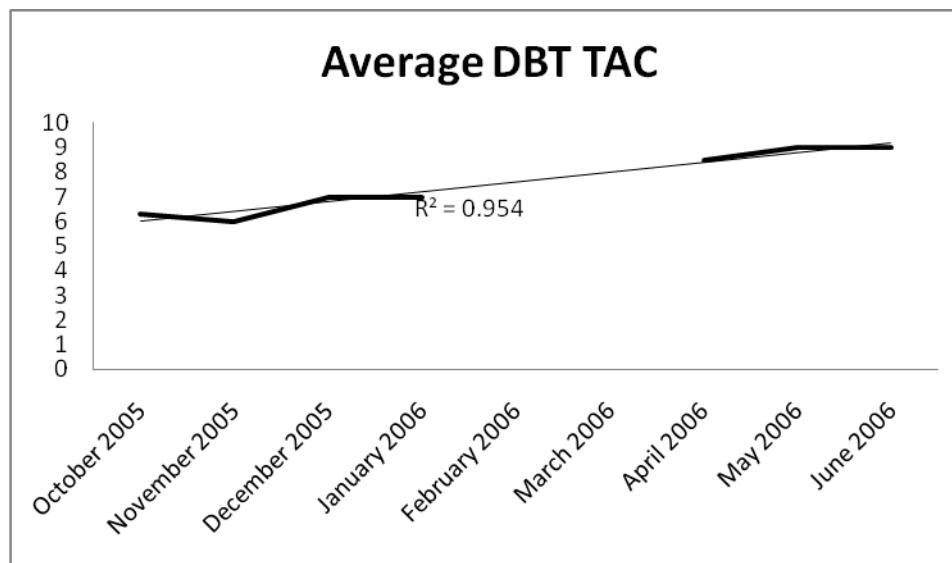
*Figure 3.23* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for “Impaired” Neuropsychological Functioning and Top 75% of Previous Hospitalizations

The individual in the “below average” range on neuropsychological functioning had 14 previous hospitalizations and had 109 days in the hospital before coming to the DBT/PR program. She was in the DBT program for 12 months and she was discharged to a group home after 14 months in the PR program. She had only three instances of restraint and seclusion throughout her admission, one in TAU and two in DBT/PR (one during her first month and one during the 13<sup>th</sup> month in the program). She was administered no PRN medications throughout her stay. Her average TAC scores started above 90% and did not go below this level during her admission to the PR program. Figure 3.24 shows the pattern of average DBT TAC scores over time. The average DBT TAC scores remain about the same over time, as the first three months her average score was approximately four and the last three months her average score was approximately five.



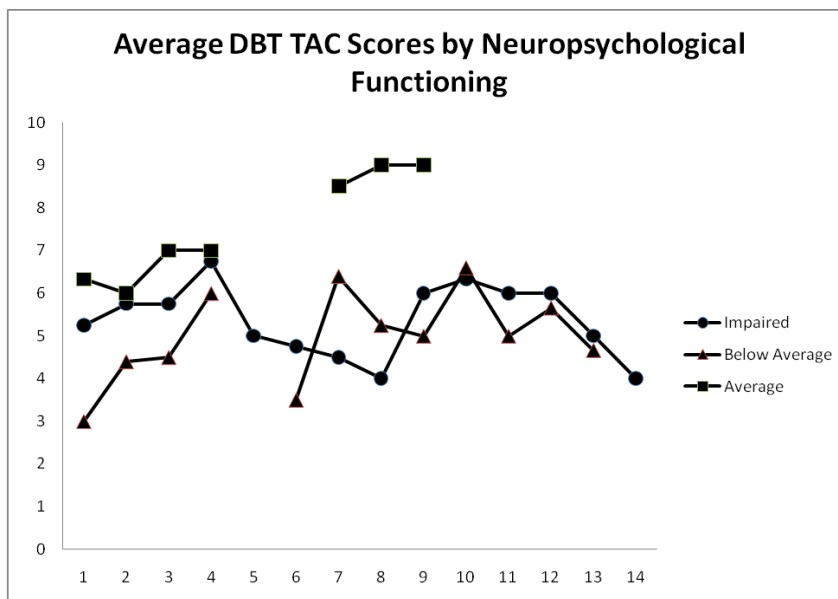
*Figure 3.24* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for “Below Average” Neuropsychological Functioning and Top 75% of Previous Hospitalizations

The individual in the “average” range on neuropsychological functioning had 33 previous hospitalizations and had 74 days in the hospital prior to entering the DBT/PR program. She was in the DBT program for nine months and she was discharged to a psychiatric residential rehabilitation program after ten months in the PR program. She did not have any instances of restraint and seclusion and she was administered only one PRN medication during her stay in the hospital. Her average TAC scores started above 95% and remained there with the exception of the month prior to discharge when the average fell to approximately 90%. Figure 3.25 shows the pattern of average DBT TAC scores over time. It is noted that months five and six have missing DBT TAC data. Nevertheless, the average DBT TAC data shows a steady increase in scores over time. At the start of DBT the average score was approximately six, while at the end of DBT the average score was approximately nine.



*Figure 3.25* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for “Average” Neuropsychological Functioning and Top 75% of Previous Hospitalizations

In comparing the outcomes for the three individuals above, the number of instances of restraint and seclusion, the number of PRN medications administered, and the average TAC data scores do not provide much information due to floor and ceiling effects. However, average DBT TAC data scores offer more insight into the efficacy of DBT for different levels of neuropsychological functioning for individuals in the top 75% of previous hospitalizations. Figure 3.26 shows the all three individuals average DBT TAC scores over time. It is noted that the individuals with “impaired” and “below average” neuropsychological functioning had scores that remained about the same, while the individual with “average” neuropsychological functioning had scores that increased steadily over the duration of the program.

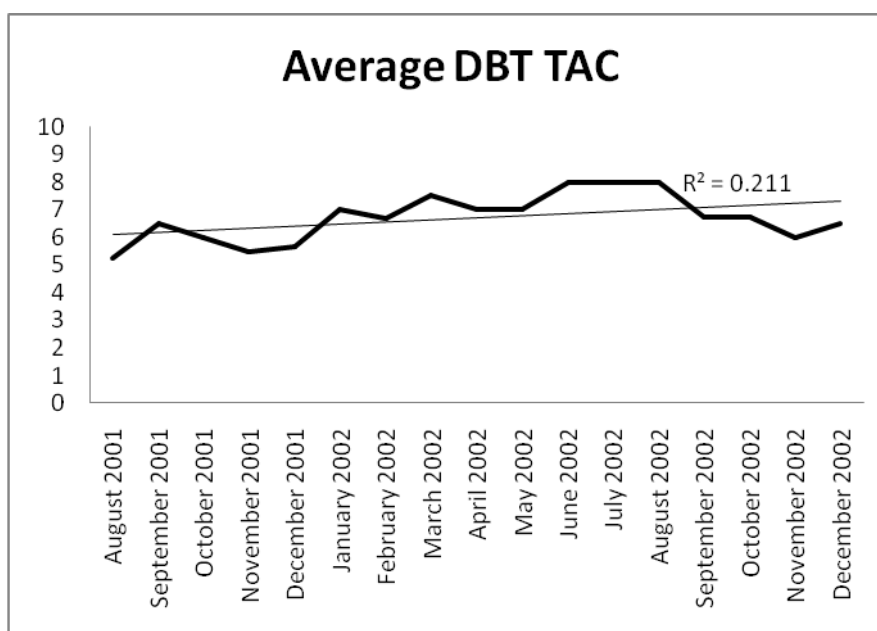


*Figure 3.26* Average DBT TAC Scores Over Time for All Three Individuals in the Top 75% of Previous Hospitalizations

Furthermore, the individual with “average” neuropsychological functioning was discharged to a psychiatric residential rehabilitation program, while the individuals with “impaired” and “below average” neuropsychological functioning was discharged to TAU and a group home, respectively. Neither the individual discharged to the psychiatric rehabilitation program nor the group home have been readmitted to the state hospital, while the individual transferred to TAU was readmitted to the state hospital within six months of her transfer from the DBT/PR program.

The second matched group examined included those individuals in the middle 50% in previous hospitalizations. The individual in the “impaired” range on neuropsychological functioning had seven previous hospitalizations and spent 31 days in the hospital before entering the DBT/PR program. She was in the DBT program for 16 months and was discharged to a residential facility after 17 months in the PR program. She had zero instances of restraint and seclusion and only two PRN medications

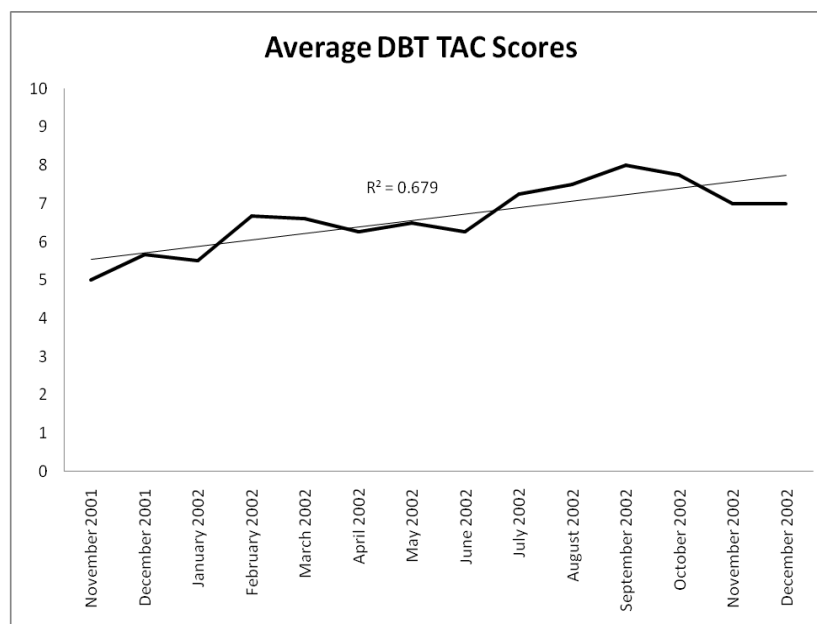
administered during her admission to the hospital. Her average TAC scores started above 90% and remained there throughout her admission to the PR program. Figure 3.27 shows the pattern of average DBT TAC scores across time. The pattern of DBT TAC scores does not show a substantial change in scores over time. Her first three months her average was 5.25, while her final three months her average was 6.5.



*Figure 3.27* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for “Impaired” Neuropsychological Functioning and 50% Previous Hospitalizations

The individual in the “below average” range on neuropsychological functioning had six previous hospitalizations and had 98 days in the hospital before coming to the DBT/PR program. She was in the DBT program for 13 months and she was discharged to her own apartment after 14 months in the PR program. She had zero instances of restraint and seclusion and zero PRN medications administered throughout her admission to the hospital. Her average TAC scores started above 95% and did not go below this level during her admission to the PR program. Figure 3.28 shows the pattern of average DBT

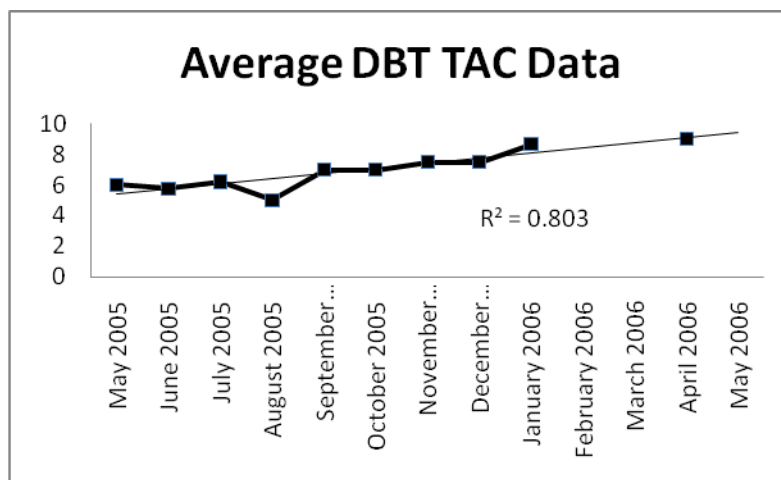
TAC scores over time. The average DBT TAC scores slightly increased over time, as the first three months her average score was approximately five and the last three months her average score was approximately seven.



*Figure 3.28* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for “Below Average” Neuropsychological Functioning and 50% Previous Hospitalizations

The individual in the “average” range on neuropsychological functioning had five previous hospitalizations and had 81 days in the hospital prior to entering the DBT/PR program. She was in the DBT program for 11 months and she was discharged to her own apartment after 14 months in the PR program. She did not have any instances of restraint and seclusion and she was administered zero PRN medication during her stay in the hospital. Her average TAC scores started above 95% and remained there throughout her admission to the PR program. Figure 3.29 shows the pattern of average DBT TAC scores over time. It is noted that months ten and eleven have missing DBT TAC data.

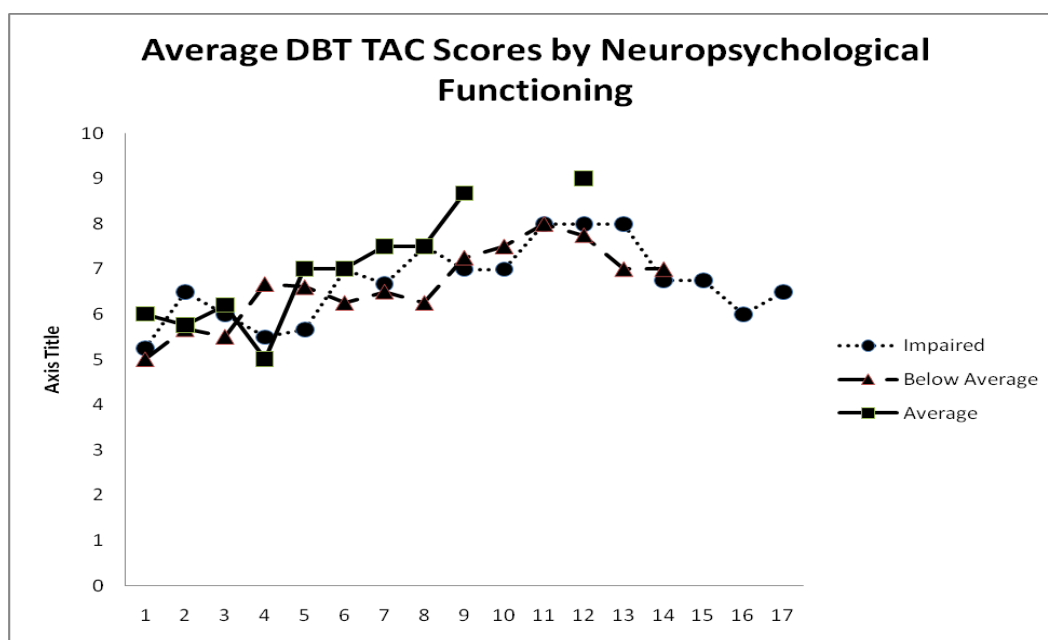
Nevertheless, the average DBT TAC data shows an increase in scores over time. At the start of DBT the average score was approximately six, while at the end of DBT the average score was approximately nine.



*Figure 3.29* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for “Average” Neuropsychological Functioning and 50% Previous Hospitalizations

In comparing the outcomes for the three individuals above, the number of instances of restraint and seclusion, the number of PRN medications administered, and the average TAC data scores do not provide much information due to floor and ceiling effects. However, much like the previous matched group, the average DBT TAC data scores offer more insight into the efficacy of DBT for different levels of neuropsychological functioning for individuals in the middle 50% of previous hospitalizations. Figure 3.30 shows the all three individuals average DBT TAC scores over time. It is noted that the individual with “impaired” had scores that remained about the same, the individual with “below average” neuropsychological functioning had scores that increased only slightly, while the individual with “average” neuropsychological

functioning had scores that increased steadily over the duration of the program. Finally, the individuals with “below average” and “average” neuropsychological functioning was discharged to their own apartments, while the individual with “impaired” neuropsychological functioning was discharged to a residential facility. None of these three individuals have been readmitted to the state hospital.

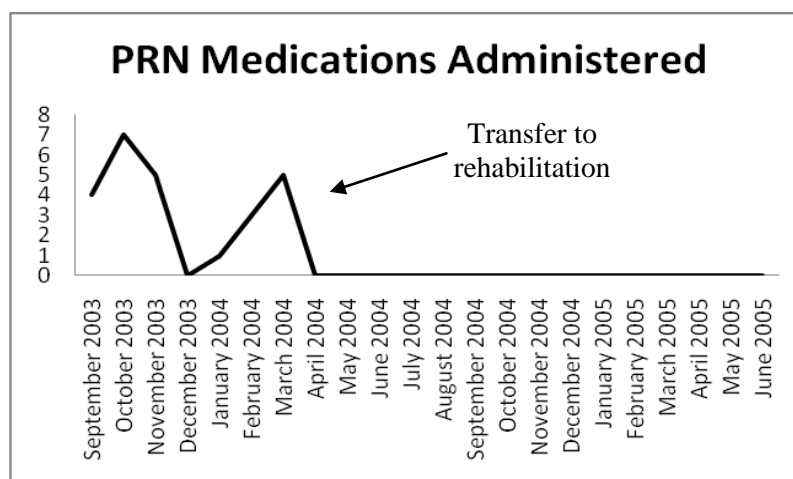


*Figure 3.30* Average DBT TAC Scores Over Time for All Three Individuals in the Middle 50% of Previous Hospitalizations

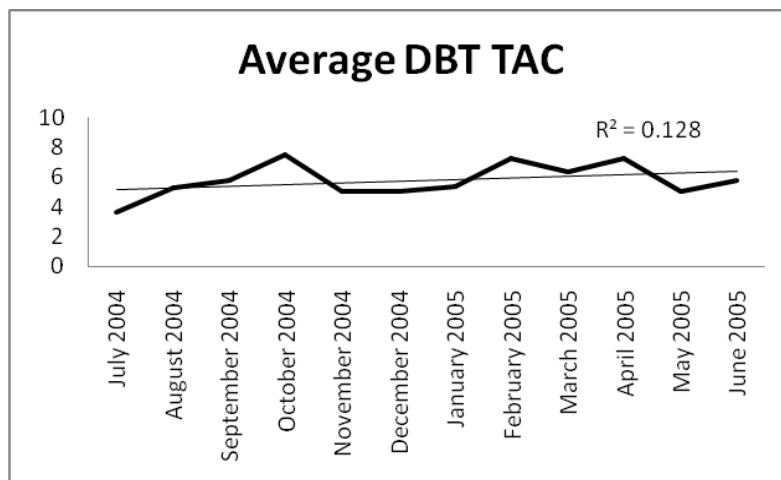
The matched pair examined two individuals in the bottom 25% in previous hospitalizations. The individual in the “impaired” range on neuropsychological functioning had three previous hospitalizations and spent 188 days in the hospital before entering the DBT/PR program. She was in the DBT program for 11 months and was discharged to an assisted living facility after 15 months in the PR program. She had only one instance of restraint and seclusion during her admission to the hospital. Figure 3.31 shows the pattern of PRN medications administered over time. The majority of the PRN



medications were administered in the TAU program (20 of 25), while the remaining PRN medications (5) were administered within the first month of the PR program. Her average TAC scores started above 95% and remained there throughout her admission to the PR program. Figure 3.32 shows the pattern of average DBT TAC scores across time. The pattern of DBT TAC does not show a substantial increase over time, as her average during the first three months was approximately five and her average during the final three months was approximately six.

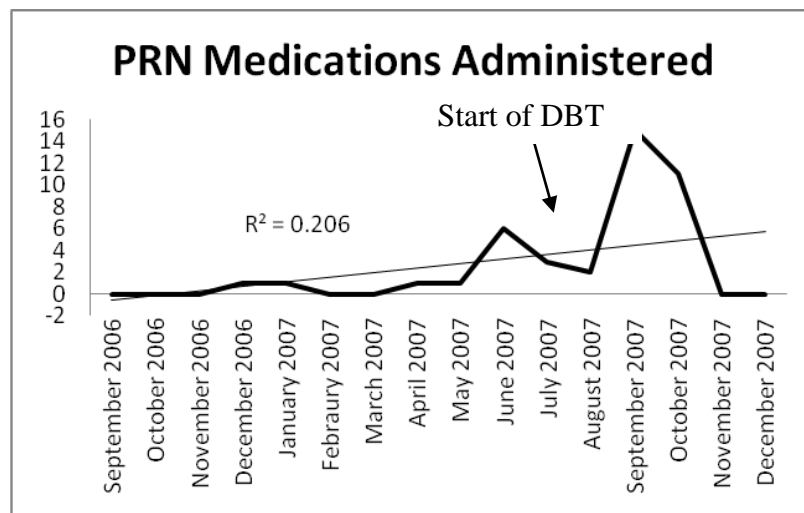


*Figure 3.31* Average Number of PRN Medications Administered per Month Over the Course of Treatment for “Impaired” Neuropsychological Functioning in the Bottom 25% of Previous Hospitalizations

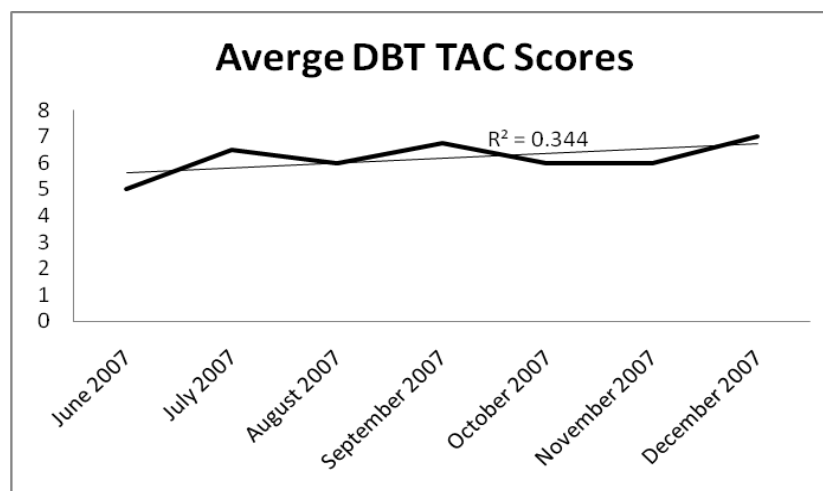


*Figure 3.32* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for “Impaired” Neuropsychological Functioning in the Bottom 25% of Previous Hospitalizations

The individual in the “below average” range on neuropsychological functioning had four previous hospitalizations and had 35 days in the hospital before coming to the DBT/PR program. She was in the DBT program for seven months and she was discharged to a substance abuse treatment facility after 14 months in the PR program. She had zero instances of restraint and seclusion during her admission to the hospital. The pattern of PRN medications administered over time is shown in Figure 3.33. There is an *increase* in the number of PRN medications administered over time. Her average TAC scores remained relatively stable throughout her time in treatment, starting at approximately 80% and ending at approximately 90%. Her average DBT TAC scores over time are shown in Figure 3.34, which increase slightly over time from an average of five at the start of the program to an average of seven at the end of the program.



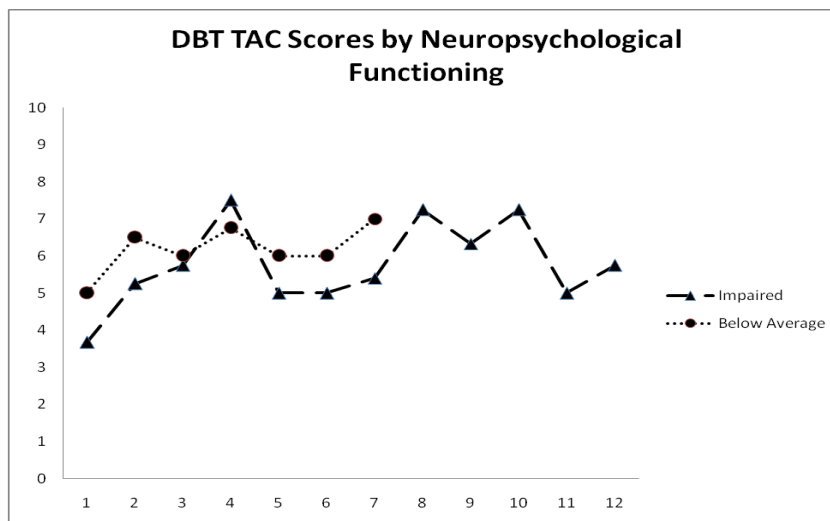
*Figure 3.33.* Average Number of PRN Medications Administered per Month Over the Course of Treatment for “Below Average” Neuropsychological Functioning in the Bottom 25% of Previous Hospitalizations



*Figure 3.34* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for “Below Average” Neuropsychological Functioning in the Bottom 25% of Previous Hospitalizations

In comparing the outcomes for the two individuals above, the number of instances of restraint and seclusion and the average TAC data scores do not provide much information due to floor and ceiling effects. However, the two individuals have different

patterns of PRN medications administered over time, as well as different DBT TAC score data patterns. The individual assessed in the “impaired” range of neuropsychological functioning showed a decrease in PRN medications immediately after her transfer to the PR program, while the individual in the “below average” range showed an increase in PRN medications administered over time. However, it is likely that the number of PRN medications administered over time is related to her substance abuse diagnosis and subsequent substance abuse treatment following the DBT/PR program. A similar pattern emerges in the matched pair as in the matched group within the middle 50% of previous hospitalizations, in that the individual assessed in the “impaired” range of neuropsychological functioning showed no substantial change over time and the individual in the “below average” range showed only a slight increase over time (see Figure 3.35). Finally, the individual in the “impaired” range was discharged to an assisted living facility and was not readmitted to the state hospital for three years and nine months, while the individual in the “below average” range was discharged to substance abuse treatment and has remained out of the state hospital since her discharge approximately two years ago.

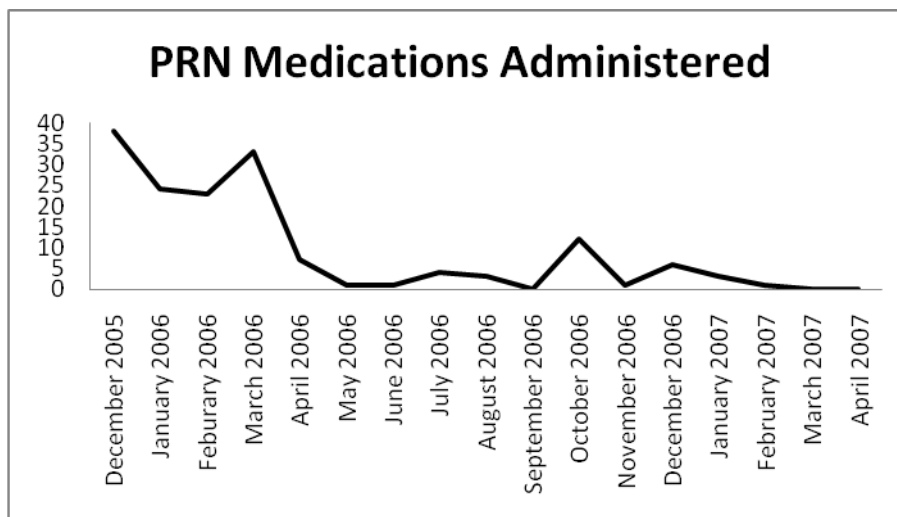


*Figure 3.35* Average DBT TAC Scores Over Time for All Three Individuals in the Bottom 25% of Previous Hospitalizations

The final analyses involve the effects of positive symptoms on DBT effectiveness. In order to determine the effects, individuals within the “average” range of neuropsychological functioning with scores in the bottom 25% (lowest BPRS score on Thinking Disorder), middle 50%, and top 25% (highest BPRS score on Thinking Disorder) of positive symptomatology were compared across outcome variables. Only those with “average” neuropsychological scores were examined in order to attempt to control for neuropsychological functioning on the effectiveness of DBT.

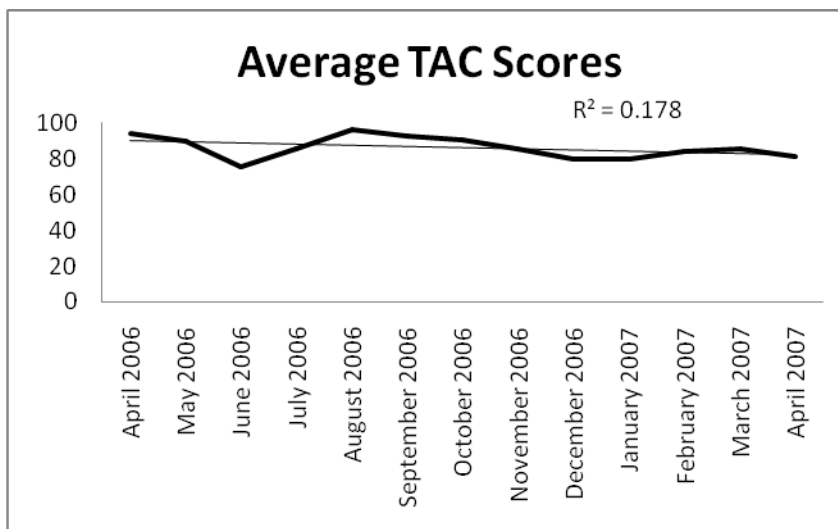
The individual in the bottom 25% on positive symptoms had a Thinking Disorder score of 5 out of a possible 35. She had zero instances of restraint and seclusion during her admission to the hospital. Figure 3.36 shows the pattern of PRN medications administered over time. The pattern of PRN medications significantly decreases over the course of treatment. She was transferred to the DBT/PR program late in the fourth month, which corresponds with a sudden drop in the number of PRN medications administered.

Furthermore, in the last three months prior to discharge, she was administered only one PRN medication.

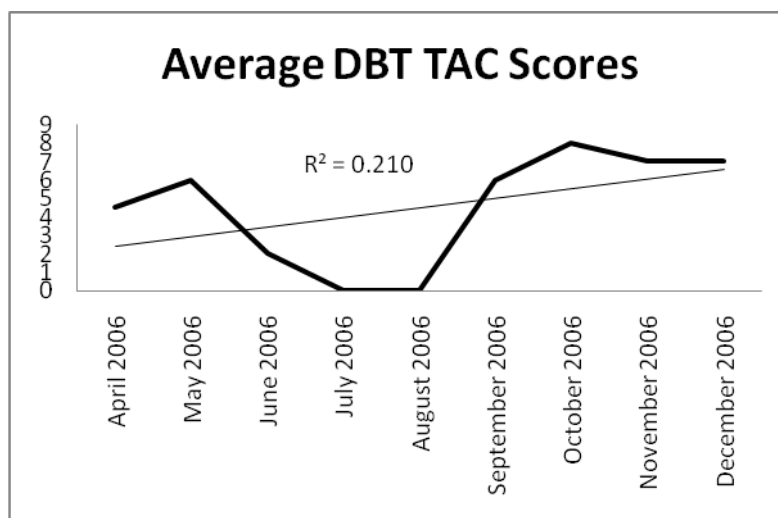


*Figure 3.36* Average Number of PRN Medications Administered per Month Over the Course of Treatment for the Bottom 25% on Positive Symptoms

Figures 3.37 and 3.38 show the pattern of average TAC scores and average DBT TAC scores over time. The pattern of average TAC scores decreases slightly over time, starting with an average of approximately 95% and ending at an average of approximately 85%. The pattern of average DBT TAC scores shows a different pattern. Although the pattern varies over time, with months four and five at an average of zero, the overall trend is an increase. She starts with an average DBT TAC score of approximately 4.5 and ends with an average of approximately seven.



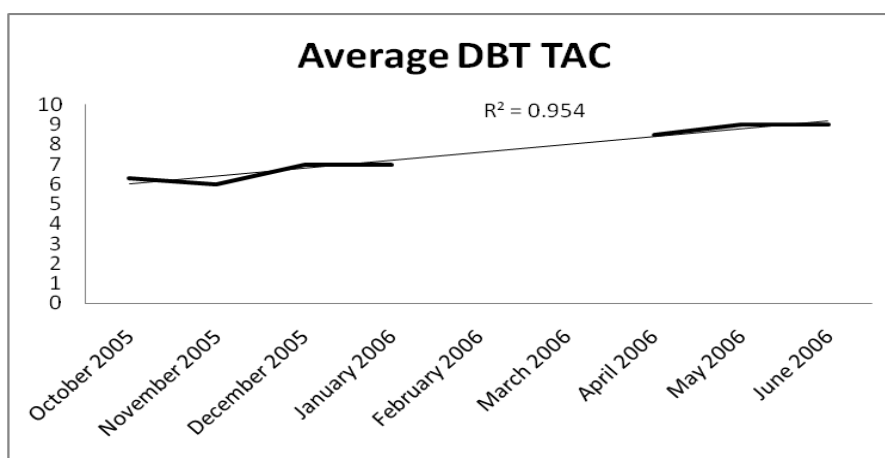
*Figure 3.37* Average TAC Scores Over Time in the Rehabilitation and DBT Program for the Bottom 25% of Positive Symptoms



*Figure 3.38* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for the Bottom 25% of Positive Symptoms

The individual in the middle 50% had a Thinking Disorder score of 8 out of a possible 35. She did not have any instances of restraint and seclusion and had only one PRN medication administered during her admission to the hospital. The data indicate that the average TAC scores started above 95% and remained there with the exception of

the month prior to discharge when the average fell to approximately 90%. Figure 3.39 shows the pattern of average DBT TAC scores across time. It is noted that months 5 and 6 have missing DBT TAC data. However, the average DBT TAC data shows a steady increase in scores over time. At the start of DBT the average score was approximately six, while at the end of DBT the average score was approximately nine.

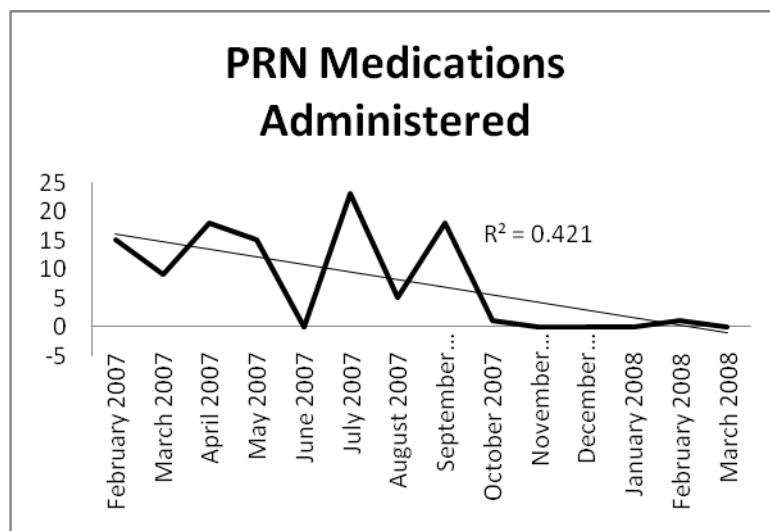


*Figure 3.39* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for Middle 50% of Positive Symptoms

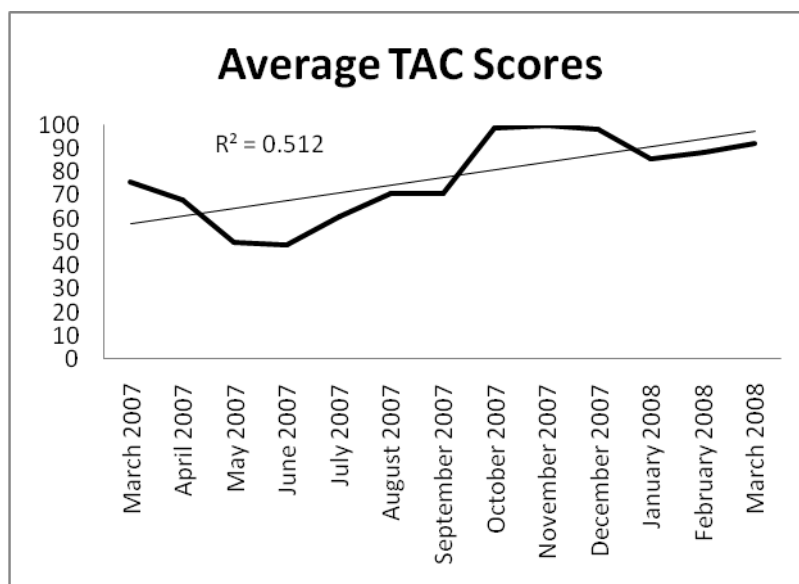
Finally, the individual in the top 25% had a Thinking Disorder score of 16 out of a possible 35. She had only three instances of restraint and seclusion that occurred in the fourth month of admission or the third month in the PR program. Figure 3.40 shows the pattern of PRN medications administered over time. Despite obvious spikes in the data, the overall pattern shows a steady decrease in the number of PRN medications administered over time. Over the last five months prior to discharge, she had only one PRN medication administered. Figures 3.41 and 3.42 show the pattern of average TAC scores and average DBT TAC scores. Both variables show a variable, yet steady increase over time. She started the program with an average TAC scores of just under 80% and



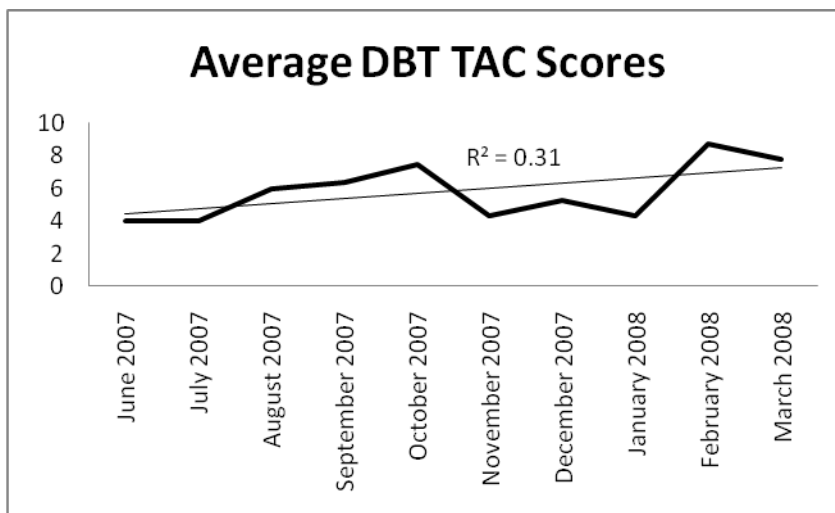
ended the program with an average TAC scores of almost 90%. She started the DBT program with an average DBT progress rating of four and ended the program with an average score of almost eight.



*Figure 3.40* Average Number of PRN Medications Administered per Month Over the Course of Treatment for the Top 25% of Positive Symptoms



*Figure 3.41* Average TAC Scores Over Time in the Rehabilitation and DBT Program for the Top 25% of Positive Symptoms



*Figure 3.42* Average DBT TAC Scores Over Time in the Rehabilitation and DBT Program for the Top 25% of Positive Symptoms

## CHAPTER 4

### DISCUSSION

The purpose of this study was to examine the effectiveness of the standard outpatient model of DBT utilized in an inpatient setting, examine the effectiveness of DBT in conjunction with different treatment modalities, and to examine possible moderating variables in the outcome of DBT. This study expands the current literature by examining the effectiveness of the standard outpatient DBT model within inpatient settings as oppose to the modified three month version of inpatient DBT that has been studied previously (Barley et al., 1993; Silk et al., 1994; Springer et al., 1996; Bohus et al., 2000; Bohus et al., 2004; Kroger et al., 2006). This study also expands the literature by examining the effects of DBT as an adjunct to treatment as oppose to the sole treatment modality on the unit.

Finally, this study expands the literature by examining the possible effects of moderating variables. The moderating variables of neuropsychological functioning and

positive symptomatology in this study are important, as previous research excluded individuals with a diagnosis of schizophrenia, bipolar disorder, cognitive deficits, and/or mental retardation (Linehan et al., 1991; Linehan et al., 1993; Linehan et al., 1994; Verhuel et al., 2003; Linehan et al., 2006; Barley et al., 1993; Silk et al., 1994; Springer et al., 1996; Bohus et al., 2000; Bohus et al., 2004; Kroger et al., 2006). Individuals who are admitted to state hospitals often have these diagnoses in addition to their diagnosis of Borderline Personality Disorder; therefore, it is important to determine if these variables significantly affect the outcome of DBT.

#### DBT Outcome Data

The data appear to indicate that utilizing the standard DBT outpatient model within a state hospital can be effective. Many of the results do not reach statistical significance, but do show a trend in the correct direction. It is noted that the overall pattern of data may be a more reliable indication of the efficacy of DBT because many individuals were excluded from the ANOVA analyses due to the fact that they did not have data points at every time period. This occurred because of the varying lengths of stay and random missing data points inherent in field studies. If the patients did not have a length of stay of at least 12 months, then all of their data was excluded in the statistical analyses. Furthermore, the number of instances of restraint and seclusion, aggression, and self-harm all showed floor effects, which violates the assumption of a normal distribution in the statistical analyses. The same is true for the ceiling effects found in the overall TAC scores. However, the overall pattern of data includes *all* individuals with data at a given time point, regardless of whether or not they had data for every time point, and

does rely on the assumption of normal distribution. Therefore, statistical analyses *and* the overall pattern of data were examined.

The overall pattern of data indicate that decreases in the number of instances of restraint and seclusion, aggressive behaviors, parasuicidal behaviors, and the number of PRN medications administered. This pattern of data supports the hypotheses that individuals receiving DBT services at the LRC will demonstrate decreases from the start of treatment to the end of treatment in the number of instances of restraint and seclusion, parasuicidal behaviors, aggressive behaviors, and the number of PRN medications administered. However, it is noted that only the number of PRN medications administered demonstrates a statistically significant difference between the number of PRN medications administered in the three months prior to the start of DBT and the number administered after 12 months of DBT.

The lack of significant results is likely due to the low number of individuals with data at every time point and the floor effects in the data. Nevertheless, the overall pattern of data is extremely important in these settings, as even one incident of restraint and seclusion due to aggressive or parasuicidal behavior can be extremely dangerous. One incident can result in patient and/or staff injuries, extreme property damage, and an increase in the number of staff members and resources required to maintain safety on the unit.

The total percentage of groups and classes increased for individuals who received DBT during their admission to the Lincoln Regional Center. This pattern of data supports the hypothesis that individuals receiving DBT services at the LRC will demonstrate increases from the start of treatment to the end of treatment in overall progress ratings for

DBT. It is noted that the increase was not statistically significant, but is likely due to the low number of participants with data points at every time point and to ceiling effects. In fact, the overall average of the number of groups and classes attended started over 93%. Ceiling effects in the number of groups and classes attended is a beneficial statistic for individuals in treatment facilities. The number of groups and classes attended equates with the amount of treatment received. Therefore, it is hoped that as patients receive more treatment they will develop more skills that will help them live successfully in a less restrictive environment.

The average DBT progress rating did not show a substantial increase across time for those individuals who received DBT during their admission to the Lincoln Regional Center. This pattern of data is inconsistent with the hypothesis that individuals receiving DBT services at the LRC will demonstrate increases from the start of treatment to the end of treatment in overall progress ratings for DBT. The average progress rating started at approximately five, meaning patients were able to verbalize knowledge of the skills in vague terms and maintained interest in learning and discussing class materials. The score at twelve months was approximately six, meaning patients could verbalize knowledge of the skill and how they might use the skill in their life circumstances, but they still demonstrated confusion regarding when and where to utilize the skill. Overall, it appears the average individual who completed the program had an understanding of the skills, but had difficulty applying them outside of therapy.

Regarding outcome following discharge for all individuals who received DBT while at the LRC, 64% of the individuals discharged went to a less restrictive environment, 11% went on to receive substance abuse treatment, while 25% of

individuals were discharged to facilities that were more or equally restrictive. There was only one individual who was discharged to a more restrictive setting (jail), and it is noted that this individual was brought to the LRC from jail and she was there for psychiatric stabilization. A court date during her admission to the LRC determined that the proper place for her was jail and not a mental health facility. The remainder of the 22% was transferred to other mental health facilities likely due to administrative decisions. Following discharge to these locations, zero individuals were readmitted to the LRC after three months, 34% were readmitted to the LRC after nine months, and 50% were readmitted to the LRC after 18 months.

Overall, this data suggests that the standard outpatient model of DBT utilized in an inpatient setting may have beneficial results. Patients, staff, and the hospital administration can benefit from fewer instances of restraint and seclusion, aggressive instances, parasuicidal behaviors, and number of PRN medications required. Furthermore, the patients appear to be taking advantage of more than 90% of the groups and classes offered to them. It is suggested that the more treatment the patient receives the more skills they will learn that will help them remain out of the hospital, which will benefit the patients and the tax payers who pay for inpatient treatment.

#### DBT Outcome Data by Treatment Modality

Examining the outcome results of DBT for everyone who participated in the program during their admission to the LRC indicated that the program had beneficial effects. However, the data also indicates that the treatment modality used in conjunction with DBT influences outcome. In order to determine the effects of psychosocial rehabilitation and TAU in conjunction with DBT and in an attempt to examine the effects

of *only* DBT, individuals receiving DBT/PR, DBT/TAU, and only TAU were compared across time on the outcome variables. However, it should be noted that the length of stay in the three different programs differed substantially. The TAU condition had an average length of stay of approximately three months, while the DBT/PR and the DBT/TAU conditions had average length of stays of approximately 14 months and 6 months, respectively. Therefore, the three groups were compared across only the first three months of treatment.

Comparing across three months of treatment for the three conditions creates a problem regarding the number of days in the hospital prior to the start of the DBT program. Individuals in the DBT/TAU had been in the hospital for an average of 60 days and individuals in the DBT/PR program had been in the hospital for an average of 101 days before entering their respective programs. It is noted that the goal of the TAU only condition is to discharge individuals to the community in a short amount of time (usually less than three months). If the individual is unable to be discharged, then they are transferred to the longer-term TAU or the PR program. This suggests a population difference between TAU only and the longer-term TAU and the PR program, as individuals in the latter two conditions may have more severe pathology and/or be more difficult to treat than the individuals in the TAU only condition. Furthermore, the beginning months of treatment for the TAU only condition are the very first months they are in treatment, whereas individuals in the DBT/PR and the DBT/TAU condition have had a few months of treatment prior to entering their respective programs. Therefore, individuals in the TAU only condition may demonstrate more acute pathology in comparison to the DBT/PR and the DBT/TAU conditions.

The pattern of data suggests these two confounding variables may influence the results across these three conditions substantially. Individuals receiving TAU only had more instances of restraint and seclusion, aggressive instances, and parasuicidal behavior in the first month than individuals in the other two conditions, which could be indicative of their acuity. However, individuals receiving TAU only decreased the number of instances of restraint and seclusion, aggressive instances, and self-harm instances to a lower level than the other two programs at month three. It is suggested that this pattern of results indicates that individuals receiving TAU only may have less severe pathology and/or may be easier to treat than the individuals who enter either the DBT/PR or the DBT/TAU condition.

Taking the possibility of different populations between the TAU only condition and the other two conditions, it appears that the most interesting comparison in order to answer the question regarding what treatment modality in conjunction with DBT is the most effective is between the DBT/PR and the DBT/TAU conditions. Therefore the DBT/PR and DBT/TAU conditions were compared across 18 months (the three months prior to starting DBT through 12 months of DBT). No statistical analyses were conducted for these comparisons, as the number of individuals in the DBT/TAU condition with data points at every time point was as small as two in some analyses. Therefore, only the overall pattern of data was examined for these two conditions.

The individuals receiving DBT/PR demonstrated fewer instances of restraint and seclusion, fewer instances of aggressive behavior, were administered fewer PRN medications, and had higher TAC scores overall. This pattern of data partially supports the hypotheses that individuals in the DBT/PR condition will decrease the number of



instances of restraint and seclusion, the number of instances of aggressive behavior, and the number of PRN medications required faster than individuals in the DBT/TAU condition. This pattern also partially supports the hypothesis that individuals in the DBT/PR will increase their overall group attendance faster than individuals in the DBT/TAU condition.

The number of instances of parasuicidal behavior demonstrated a different pattern, as the individuals receiving DBT/PR had fewer instances of self-harm at three months prior to the start of DBT and three months after the start of DBT than individuals in the DBT/TAU condition, but at six months both treatment groups had zero instances of restraint and seclusion. This pattern does indicate that the number of instances of parasuicidal behavior decreased faster for those in the DBT/PR condition. Therefore, the hypothesis that the number of instances of parasuicidal behavior will decrease faster for individuals in the DBT/PR condition than for those in the DBT/TAU condition is supported.

Unfortunately, individuals in the DBT/TAU condition had a lack of data regarding their progress in the DBT program due to programmatic difficulties during the time this study took place. Therefore, it is impossible to compare the DBT progress ratings between the two groups. This makes it nearly impossible to determine the effects of DBT versus the effects of the individual treatment programs (PR vs. TAU). The data appear to indicate that the treatment programs have the most effect on outcome, as the conditions differed prior to the start of the DBT program. Nevertheless, it cannot be stated that DBT had no effect for individuals who completed the program, it can only be

said that the effect of DBT in absence of the adjunct treatment is undetermined at this time.

Despite not knowing the effects of only the DBT program, the data does suggest that DBT in conjunction with PR is the most effective treatment for individuals with Borderline Personality Disorder characteristics in comparison with the other two treatment modalities examined in this study. Readmission rates for the DBT/PR condition were under 15% after 18 months, while the readmission rates for the DBT/TAU and TAU only conditions were 33% and 75% after 18 months, respectively. Therefore, despite the different population in the TAU condition and the ability for treatment teams to discharge individuals within three months, it does not appear that treatment was effective for individuals who received this treatment. In fact, it appears that DBT/TAU is better for individuals with these characteristics than only TAU; however, DBT/PR appears to remain the best treatment for these individuals in regards to staying out of the hospital following discharge.

Regarding discharge locations, 49.6% of individuals who received DBT/PR were discharged to less restrictive settings and settings that stressed independent living. In fact, 24.6% of the individuals in the DBT/PR program were discharged to their own apartments, either with supervision or without supervision. In comparison, 50% of the individuals in the DBT/TAU condition were transferred back to TAU instead of being discharged to a less restrictive environment. Some of these cases were transferred due to administrative concerns regarding safety to the individual and/or other patients and staff on the unit. Furthermore, only 10% of individuals in the DBT/TAU condition were discharged to their own apartment and only 10% of individuals were discharged to a

setting that stressed independent living. For individuals receiving only TAU, only 17% of individuals were discharged to their own apartments and no individual was discharged to a setting that stressed independent living.

This data indicates that individuals who received DBT/PR were discharged to more independent living settings where the majority of individuals did not require another hospitalization at the Lincoln Regional Center. These results appear to be in direct contrast to the literature stating that inpatient hospitalizations are often ineffective and often have iatrogenic effects for individuals with Borderline Personality Disorder (Miller, 1989; Swenson, Sanderson, Dulit et al., 2001; Bohus, Haaf, Stiglmayr et al., 2000; Linehan, Comtois, Murray et al., 2006). Instead, this data suggests this is true for individuals who receive only TAU, while individuals who receive longer term treatments with DBT as an adjunct typically fair better following discharge. Furthermore, individuals who receive PR in conjunction with DBT show very low readmission rates and discharge to more independent living settings.

#### Moderating Variables

This study examined possible moderating variables and found that the number of previous hospitalizations showed a significant positive correlation with the number of instances of self-harm and a significant negative correlation with the overall number of groups and classes attended. The number of previous hospitalizations was negatively related to the number of instances of restraint and seclusion and showed a medium effect size, despite not reaching statistical significance. Furthermore, although not significant, the number of inpatient days prior to the start of DBT was negatively related to the

number of instances of restraint and seclusion, aggression, and self-harm with medium effect sizes.

In addition to the number of previous hospitalizations and the number of inpatient days prior to the start of DBT, the level of neuropsychological functioning and the level of symptomatology was assessed in regards to DBT effectiveness because past research has excluded individuals with cognitive impairments and those with diagnoses of Bipolar Disorder and schizophrenia-spectrum disorders. The results suggest that individuals in the “impaired” range of neuropsychological functioning (two or more standard deviations below the mean) do not benefit from DBT, as their DBT progress ratings did not increase over time. Individuals in the “average” range of neuropsychological functioning (between one and two standard deviations below the mean) did show some benefit, but the increase in progress ratings was very small over time (usually 2 points or less). However, it appears that individuals in the “average” range of neuropsychological functioning benefit from DBT, as their scores increased from 6.5 at the start to around 9 at the end of the program.

The difference in scores for individuals with “impaired,” “below average,” and “average” scores on neuropsychological functioning is important if the meaning behind the scores is examined. Those individuals who were assessed in the “impaired” and “below average” range on neuropsychological functioning ended the DBT program with progress ratings of approximately six, meaning that they are able to verbalize knowledge of the skills and how they might be useful in their own lives. However, individuals with a progress rating of approximately six have substantial difficulty actually applying the skills outside of therapy. On the other hand, those individuals in the “average” range of

neuropsychological functioning who end the program with a score of approximately nine are able to verbalize knowledge of the skills and how they are used for personal life circumstances. They demonstrate very little confusion regarding the use of the skills. Therefore, not only do individuals in the “average” range of neuropsychological functioning show a greater increase in their progress ratings over time, but they also appear to demonstrate the ability to utilize the skills in their personal lives outside of therapy. Those in the “impaired” or “below average” range have substantial difficulty applying the skills outside of the therapy group.

This data may appear to suggest that individuals with impaired levels of neuropsychological functioning should be excluded from DBT programs. However, there are DBT programs that are specifically designed for individuals with low cognitive functioning. The New Outlook Program discussed above at Fulton State Hospital has developed a DBT program for individuals with mental retardation. What this suggests is that individuals with impaired levels of neuropsychological functioning do not benefit from the standard outpatient model of DBT, but may benefit from a program that has altered their program specifically for this population. For example, Fulton State Hospital has diary cards that include only pictures and do not depend upon reading level. Furthermore, different techniques for teaching skills may need to be utilized instead of the classroom setting and individual therapy that is used in the standard outpatient model of DBT.

Finally, this data suggests that the presence of positive symptoms does not preclude individuals from benefiting from DBT if they are in the average range on neuropsychological functioning. An individual in the bottom 25% of positive symptoms

and an individual in the top 75% of positive symptoms both showed significant decreases in the number of PRN medications administered over time. Furthermore, all individuals examined (the individual in the bottom 25%, the individual in the middle 50%, and the individual in the top 75% of positive symptoms) all demonstrated an increase in their DBT scores over time.

### Study Limitations

These results begin to answer questions regarding the effectiveness for different populations and the usefulness of the standard outpatient model utilized in an inpatient setting; however, there are some limitations of this study that should be addressed in future studies. First, the low number of individuals in this study and the amount of missing data made it difficult to utilize statistical tests in the analyses. Data trends were examined over time, but significance tests were unable to be utilized in some instances. Furthermore, the low number of participants made it impossible to utilize regression models to examine moderating variables. In future research with more participants, regression models will be helpful in determining the role of moderating variables in DBT effectiveness.

Second, the number of instances of restraint and seclusion, aggressive behaviors, and self-harm behaviors demonstrated floor effects that violated the assumption of a normal distribution and, again, made it difficult to examine statistical significance. Although these behaviors are important in a state hospital setting, the frequency of these behaviors may be too low. It will be useful in future research to use a more sensitive measure of aggression and self-harm. It may be useful to measure aggressive and self-harm behaviors that do not warrant restraint and seclusion, such as threatening comments

and self-harm statements or gestures. This may provide a better indication of the effectiveness of DBT on these variables.

Third, a control group that is similar to the condition receiving DBT would be helpful in determining what happens if individuals do not receive DBT. In this study the control group had a much shorter length of stay than the other two groups that did receive DBT, making it difficult to compare patterns over time. The short length of stay is especially difficult because the DBT program was intended to run for an entire year, meaning the pattern of data that was comparable over the three groups only included the first third of the DBT program. Finally, similar conditions would likely make it possible to use random assignment of individuals to each condition, decreasing the chances of having a different population in the control group than in the treatment groups.

Fourth, information regarding the readmission rates for this study only came from the Lincoln Regional Center. Therefore, readmissions that occurred in a different state, readmissions that occurred in a different hospital in the state, and admissions to psychiatric units within medical hospitals and crisis centers were not captured in these statistics. Statistics gathered on the use of all mental health service utilization would be extremely useful in future studies in order to determine the cost of mental health services after treatment in programs utilizing DBT.

### Conclusion

Overall, the data indicate that DBT is an effective treatment for individuals in a state hospital. However, the treatment modality that DBT is taught in conjunction with is an important consideration, as the DBT/PR program shows the most effective results during the hospital admission and after discharge. The data also suggest that individuals

with “impaired” levels of neuropsychological functioning should attend DBT programs modified for those with cognitive deficits, as it does not appear they benefit greatly from the standard outpatient DBT model. Nevertheless, it appears that positive symptoms do not preclude individuals from benefiting from DBT if their neuropsychological functioning is in the “average” range.

This data lends itself to a number of suggestions for treatment facilities and treatment providers. First, it appears that utilizing the standard outpatient model of DBT is effective in inpatient settings if the length of stay is a year or longer and allows for the individuals to receive the entire DBT program. If the length of stay is shorter than one year, it is likely more effective to utilize the DBT programs designed for inpatient settings with an average length of stay of only three months (Swenson, etc). Therefore, providers need to consider their setting when choosing a model of DBT to implement.

Second, utilizing DBT in conjunction with PR is more effective than utilizing DBT in conjunction with TAU. However, both are more effective than receiving only short-term TAU without any DBT. This may be in contrast to past research showing inpatient hospitalization is ineffective or harmful to individuals with Borderline Personality Disorder; however, this data suggests that longer-term treatment in conjunction with DBT is more effective than short-term TAU. However, this study did not examine the effects of utilizing the alternative inpatient DBT treatment that is designed for a shorter length of stay. It could be that utilizing the inpatient model of DBT will increase the success of individuals who only received the TAU. Nevertheless, when considering options, treatment providers who will be treating individuals for longer than



three months should consider the fact that PR for this population appears to be the most effective adjunct to DBT.

Third, providers should consider the level of neuropsychological functioning when deciding what treatment is best for an individual. This data suggests individuals with “impaired” levels of neuropsychological functioning do not benefit from the standard outpatient model of DBT. If an individual has “impaired” neuropsychological functioning, alterations to this model will likely need to be utilized in order to help the person learn the skills from the program and use them in their day-to-day lives. Current treatment programs have been developed for this population; however, a lack of published literature exists for treatment providers.

In conclusion, it appears that individuals with Borderline Personality Disorder traits that require inpatient treatment do benefit from the standard outpatient model of DBT if their length of stay is long enough to make the program worthwhile and if they do not have an “impaired” level of neuropsychological functioning. DBT/PR is most effective in the treatment of this population, but DBT/TAU is more successful than TAU if treatment providers do not have PR available to them. It appears that the DBT/PR treatment modality is rather effective at stopping the revolving door phenomenon, which likely decreases the mental health expense associated with the treatment of this population. This study provides beginning evidence against the long held belief that treatment is ineffective and begins to demonstrate that this group of individuals can be treated successfully.

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## APPENDIX

## CHART REVIEW FORM

Participant Number Code: \_\_\_\_\_

Age at Admission: \_\_\_\_\_

Race: \_\_\_\_\_

Date of Admission: \_\_\_\_\_

Education: \_\_\_\_\_

Number of Previous Hospitalizations: \_\_\_\_\_ Marital Status: \_\_\_\_\_

Number of Days in Inpatient Treatment in Past Year: \_\_\_\_\_

Date of Discharge: \_\_\_\_\_

Discharge Location: \_\_\_\_\_

Medications at Initial

Assessment: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_.

Medications at Discharge:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_.

**Diagnoses:**

Axis I:

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

D. \_\_\_\_\_

Axis III:

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

D. \_\_\_\_\_

Axis II:

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_







