# A PILOT STUDY OF TWO BRIEF FORMS OF DBT SKILLS TRAINING FOR

## EMOTION DYSREGULATION IN UNDERGRADUATES

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#### Abstract

This pilot study examined the feasibility of an abbreviated DBT skills program for emotionally dysregulated undergraduates and also aimed to assess whether there was an additive benefit of mindfulness in group skills training by comparing two brief DBT skills groups: emotion regulation skills training (ER) only and emotion regulation with core mindfulness skills (M+ER). Participants were undergraduate students aged 18 years or older at a large state university. Participants were assigned to either the M+ER or ER condition; both groups completed two-hour weekly sessions over the course of eight weeks and completed outcome measures at baseline, mid-treatment, post-treatment, and 4-week follow-up. Primary outcomes were emotion dysregulation, depression, anxiety, and stress, positive and negative affect, mindfulness, DBT skills use, and work and social functioning. Results suggest that abbreviated DBT skills training may be an effective intervention for problems of emotion regulation, as participants made significant gains across outcome measures with primarily large effect sizes at post-treatment and 4-week follow-up. However, no additive benefit of mindfulness skills training was found, as there were no significant differences in outcomes between groups. In addition, positive feedback and low attrition support the acceptability of abbreviated DBT skills training in a college setting but impediments to feasibility included difficulty recruiting participants, in part due to the scheduling constraints of the college lifestyle. Implications of the findings and future directions are discussed.

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### Chapter I

### Introduction

### Mental Health in College Settings

College represents a major period of transition for young adults that brings greater independence and enhanced social and academic opportunities. While such change is often exciting and enjoyable, it can also serve as a major stressor and heighten risk for psychological problems such as depression, anxiety, suicidality, and substance abuse. In fact, almost fifty percent of the college population can be diagnosed with at least one mental health disorder in any given year (Blanco et al., 2008) and suicide is the second leading cause of death among college students (Suicide Prevention Resource Center, 2004). Mental health problems may have significant impact on students' abilities to function socially, academically and occupationally. In a recent survey of college students across the United States, 20% cited anxiety and 12% cited depression as impairing academic success, and 30% reported feeling "so depressed that it was difficult to function" within the past twelve months (American College Health Association, 2011).

Despite the prevalence of mental disorders in the college population and the resultant need for effective and evidence-based treatments in college settings, there is a dearth of research on psychological interventions in college settings, as well as a number of obstacles to implementing such treatments, particularly manual or protocol-based interventions (Cooper, 2005). One significant challenge to the implementation of mental health treatment is the academic calendar, which limits the number of consecutive weeks that therapy can be provided due to inflexible breaks and relatively few weeks per quarter

(usually ten) or semester (usually 15). In addition, the varied schedules of undergraduates make group treatment, in particular, very difficult to schedule in a way that maximizes attendance, as academic classes are offered from early morning to late night and a range of extracurricular activities occur throughout the day, limiting students' availability. As such, treatment in college settings is typically very brief; one study found the student clients attended an average of 3.3 sessions in college counseling centers (Draper, Jennings, Baron, Erdur, & Shankar, 2002). These logistical dilemmas are compounded by problems such as limited funding and limited staffing in college counseling centers, which makes the implementation of evidence-based treatments even more challenging. Thus, there is a significant need for investigations of evidence-based treatments in university settings that are adapted to fit the unique constraints of college, particularly treatments that are sufficiently brief to accommodate scheduling limitations and sufficiently appealing to students to prevent treatment drop-out.

### Brief Overview of Dialectical Behavior Therapy

One such evidence-based treatment, Dialectical Behavior Therapy (DBT; Linehan, 1993), is a comprehensive treatment that was initially developed to treat Borderline Personality Disorder (BPD) and suicidality. However, DBT in particular may be useful in college settings, as it has been increasingly adapted for a range of disorders familiar to college campuses, such as substance abuse, eating disorders, and mood disorders. The effectiveness of DBT in helping patients regulate extreme emotions and the treatment's aim to strike a balance between acceptance and change strategies make DBT applicable to a wide range of pathology. In addition, its multiple components might be found to be effective short-term treatments when dismantled. To-date, over a dozen randomized controlled trials (RCTs) have been conducted investigating the efficacy of DBT, making it the most researched intervention for BPD (Kliem, Kröger, & Kosfelder, 2010). There is also a growing body of research investigating DBT for other forms of psychopathology including substance abuse (Linehan et al., 2002; Linehan et al., 1999; van den Bosch, Koeter, Stijnen, Verheul, & van den Brink, 2005), treatment-resistant depression (Lynch, 2000; Lynch, Morse, Mendelson & Robins, 2003), and eating disorders (Hill, Craighead, & Safer, 2011; Kroger et all, 2010; Safer & Jo, 2010; Safer, Telch & Agras, 2001; Telch, Agras & Linehan, 2001) that has largely found DBT to be as effective as, if not superior to, treatment-as-usual and other evidence-based approaches.

DBT has primarily been investigated in its entirety as a 12-month, comprehensive psychosocial treatment that consists of four components: individual psychotherapy, group skills training, phone coaching, and clinician consultation team. Group skills training is further divided into four modules: mindfulness, emotion regulation, interpersonal effectiveness, and distress tolerance. Some studies have found evidence that a shorter, six-month course of DBT is effective in treating symptoms of BPD and emotion dysregulation (Carter, Willcox, Lewin, Conrad & Bendit, 2010; Koons et al., 2001; Stanley, Brodsky, Nelson & Dulit, 2007). A study of comprehensive DBT in a university setting in which participants completed seven to twelve months of treatment found that participants made significantly greater improvements on measures of suicidality, depression, self-injury and psychotropic medication use when compared to participants in the treatment-as-usual condition (Pistorello, Fruzzetti, MacLane, Gallop, & Iverson, 2010). DBT skills training alone (without individual therapy) has been found to be effective for several problems including treatment-resident depression in adults (Harley et al., 2008), oppositional defiant disorder in adolescents (Nelson-Gray et al., 2006), and emotion dysregulation across a broad variety of mental health disorders (Neacsiu & Linehan, 2012). There is also evidence that active use of DBT skills by participants mediates improvements in suicidal and non-suicidal self-injurious behaviors, depression, and control of anger (Neacsiu et al., 2010).

While DBT and DBT skills training appear to effectively treat BPD and other disorders, there is a lack of studies that have systematically dismantled the components of comprehensive DBT or the modules within DBT skills training to determine which elements, or which skills, are necessary or sufficient to produce change within or across disorders. Such investigations are much needed, as it is unclear whether even fewer modes would be as effective as comprehensive DBT, or if specific skills modules are more effective than others. This type of research would be particularly helpful for mental health providers in college settings, where time constraints and other factors necessitate shorter forms of treatment. In addition, investigation and implementation of interventions that target underlying mechanisms common to multiple disorders, such as emotion dysergulation, would be an effective way to address the multiple pathologies treated by college counseling centers.

#### Emotion Dysregulation

Emotion dyseregulation is a major feature of many mental health disorders (Gross & Levenson, 1997) and can be attributable to a number of factors, from biological predisposition to skills deficits, environmental contingencies, and distortions in cognitive appraisal. Emotion dysregulation manifests in internalized problems such as depression,

anxiety, and behavioral avoidance as well as externalized problems such as anger outbursts, interpersonal conflict, substance use, and self-injury. Such problems may be due to emotional suppression or, conversely, to rumination and heightened reactivity to emotions. DBT emotion regulation skills target skills deficits, cognitive appraisal, and environmental contingencies in order to help individuals improve their ability to understand their emotional experience, regulate emotions effectively, and both decrease the frequency and intensity of negative emotions and increase the presence of positive emotions. Skills group participants are taught to tolerate negative emotions without making the situation worse and are also taught how to change unwanted emotions with

#### Mindfulness

DBT emotion regulation skills most specifically and explicitly target problems of emotion dysregulation, but mindfulness skills are also considered core to DBT and are assumed to improve individuals' ability to regulate emotions. Mindfulness is conceptualized as the intentional direction of one's attention to the current moment, including one's sensory, cognitive, and emotional experiences, without judgment (e.g., good or bad, right or wrong). It is considered a way to increase attentional control and thus reduce the rumination and judgment that contribute to emotional pain. Mindfulness is drawn from Buddhist practices and is not unique to DBT; it has been used on its own and in conjunction with other treatments, including cognitive-behavioral therapy. Treatments that incorporate mindfulness have been shown to be effective for a variety of mood-related problems including depression (Kingston, Dooley, Bates, Lawlor & Malone, 2007; Ma & Teasdale, 2004) and anxiety (Evans et al., 2008; Kabat-Zinn et al., 1992). Mindfulness has been found to facilitate emotion regulation (Kabat-Zinn, 1994) as well as attentional control, perhaps because mindfulness requires that one be aware of, rather than suppress, emotional experience and learn to accept and tolerate both negative and positive emotions. Mindfulness of one's emotion (i.e., being aware of and noticing an emotion without getting caught up in it or judging it) is, in fact, a skill taught within the emotion regulation skills module of DBT. There is some evidence that mindfulness practice and emotion regulation are linked. Erisman, Salters-Pedneault & Roemer (in preparation) found a significant relationship between self-reported levels of mindfulness and scores on a measure of emotion regulation difficulties, and another study found strong correlations between self-reported mindfulness and self-reported use of adaptive emotion regulation strategies (Feldman, Hayes, Kumar, Gresson, & Laurenceau, 2007). However, both studies were based on correlational data, and a causal relationship between mindfulness and emotion regulation regulation cannot be determined.

#### Current Study: Aims

The current pilot study aims both to assess the feasibility of an abbreviated dbt skills program for emotionally dysregulated undergraduates as well as to examine whether there is an additive benefit of mindfulness in group skills training by comparing two brief DBT skills groups: emotion regulation skills training only (ER) and emotion regulation with core mindfulness skills (M+ER). We aim to assess whether eights week of skills training is sufficient to produce significant improvements in measures of emotion regulation, mood, and social and academic functioning, and whether it is feasible to enroll and retain a substantial number of students. In addition, we will determine if participants in the M+ER group show greater improvements than those in the ER-only group. The first hypothesis for the study is that participants in both groups will show improvements in emotion regulation, general distress, use of coping skills, and functioning across work and social domains. The second hypothesis is that there will be an additive benefit of mindfulness skills, since these skills aim to help participants increase acceptance of reality and decrease rumination, judgments, and suppression of emotional experience. We hypothesize that participants in the M+ER group will demonstrate greater reductions in difficulties regulating emotions, larger improvements in mood ratings, greater use of mindfulness skills, and reduced impairment in social and occupational functioning when compared to participants in the ER group.

#### Chapter II

#### Methods

#### *Participants*

Study participants were 24 undergraduate students (ages 18 to 29) at a major public university who reported significant problems with emotion regulation. Participants were primarily female (21 females, 3 males) and Caucasian (17 Caucasian, 4 Asian, 3 African American). Subjects were recruited through on-campus flyers and emails sent to students enrolled in general psychology courses as well as to residents of university dormitories. Participants were also referred by staff at the university counseling center. Interested individuals completed a brief phone screen to assess problems with emotion regulation, such as feeling overwhelmed by emotions and losing behavioral control in the presence of strong emotions. Individuals who answered "yes" to at least five of eight questions on the phone screen were brought in to complete a baseline assessment used to determine final eligibility. Study eligibility required that individuals be at least 18 years of age, currently be enrolled as undergraduates at the university, and demonstrate significant problems with emotion regulation, operationalized as a score at least 105 on the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a self-report measure of emotion dysregulation completed during the baseline assessment. Notably, the average DERS score for participants was 121.83 which is well above the 105 cut-off and indicates significant problems with emotion regulation. During the baseline assessment, participants were also interviewed by doctoral-level graduate students to assess for any Axis I diagnoses as well as the presence of BPD. Participants

with previous exposure to DBT skills and those that met criteria for psychotic disorders or other life-threatening conditions, such as life-threatening anorexia, were excluded.

We received a total of 91 calls from interested students. Of these calls, 26 students were referred by the campus counseling center, 23 students saw flyers posted around campus, 19 students received emails through an undergraduate psychology course, and 23 were referred through other methods. Of those who called to learn more about the study, 12 did not complete the phone screen due to lack of interest after hearing the study descriptions. Of the remaining 79 students who completed phone screens, 41 completed the phone screen but not the intake (17 did not meet criteria, 13 had scheduling conflicts with group times, and 11 were eligible at phone screen but chose not to attend the intake). A total of 38 students completed the intake, of which 7 were ruled ineligible because they did not score over 105 on the DERS. A total of 31 students were eligible for the study, but 7 eligible students chose not to enroll due to scheduling conflicts, family demands, or lack of interest. In total, 24 participants enrolled in the study.

#### Procedures

Individuals who screened positive on the phone screen were brought in for a baseline assessment. Study procedures were explained and consent to procedures, including video-recording of all groups and assessments, was obtained. At the assessment, eligibility was determined by having individuals complete the DERS. Those who scored under 105 were thanked and immediately dismissed. If individuals scored at least 105 on the DERS, they completed a semi-structured interview conducted by a pre-doctoral level research assistant using the Structured Clinical Interview for DSM Axis I Diagnoses (SCID-I; First, Spitzer, Gibbon & Williams, 2002) to evaluate whether or not

participants meet criteria for Axis I diagnoses according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000). Interviewers also conducted the BPD section only of the Structured Clinical Interview for DSM Axis II Diagnoses (SCID-II; First, Gibbon, Spitzer, Williams & Benjamin, 1997) in order to determine if participants met full criteria for BPD, although a diagnosis of BPD was not required for study inclusion.

Participants were assigned to one of two skills groups based on their scheduling availability. While random assignment would have increased the internal validity of the study, the complex nature of undergraduates' schedules and the difficulty of identifying a time when most individuals were available made it necessary to gather participants' scheduling availability and identify two group times that allowed for maximum participation. Random assignment would have precluded the participation of most participants due to limited availability. Each group consisted of eight weekly, two-hour skills training groups using a protocol adapted from Linehan's updated DBT Skills Training Manual for BPD (in press). The M+ER group received two weeks of mindfulness skills training followed by six weeks of emotion regulation skills. During mindfulness, participants were taught to observe the present moment, to notice and let go of thoughts and emotions as they arise, and to reframe judgments in non-judgmental ways. The ER group received the emotion regulation skills only spread out over eight weeks, with all references to mindfulness skills removed. During emotion regulation skills, both groups learned about the communicative function that emotions serve, regulatory skills based on the context in which the emotion arises, and how to take adequate care of basic needs in order to reduce vulnerability to negative emotions. Only

the M+ER group learned the DBT emotion regulation skill "mindfulness of current emotion," which teaches individuals to notice their emotional experience at a sensory level without doing anything to suppress or enhance the emotion. Both group formats consisted of an hour-long homework review followed by an hour-long didactic. All participants completed and turned in a DBT Diary Card each week in order to track daily ratings of mood, behavioral problems, and skills use. A skills trainer and co-leader conducted groups according to the Skills Training Manual protocols. Group leaders were pre-doctoral level, DBT-trained graduate students who reviewed training tapes for each skill session prior to leading groups and also met for weekly supervision with a licensed psychologist who specializes in DBT or with an advanced pre-doctoral student with experience leading DBT skills groups. All groups were video-recorded and tapes were reviewed by the study supervisors.

Outcomes were obtained at pre-, mid-, post-treatment, and follow-up using online self-report questionnaires that participants completed at 0, 4, 8 and 12 weeks from baseline. To collect data, we used PsychData.com, a secure online website that was specifically designed for social science researchers to comply with Institutional Review Board (IRB) requirements that protect data security and participant confidentiality. Participants were compensated \$15 at mid-treatment and \$25 at both post-treatment and follow-up if they completed the surveys within three days of being emailed the link.

Due to our difficulties recruiting participants and resultant small sample size, we chose to run the study in the spring semesters over three consecutive years. The first cohort consisted of four participants and all were assigned to the M+ER condition. Follow-up questionnaires were not implemented until the second year and so these first

participants did not provide follow-up data. In the second cohort, 5 participants were assigned to the M+ER condition and 6 participants were assigned to the ER condition. In the third and final cohort, 7 participants were assigned to the M+ER condition and 2 participants to the ER condition.

#### Measures

*The Structured Clinical Interview for DSM Diagnoses* (SCID; First et al, 1995) is a semi-structured clinician-administered clinical interview to assess current and lifetime diagnoses of psychological disorders described in the Diagnostic and Statistical of Mental Disorders, 4<sup>th</sup> Edition (DSM-IV-TR; APA, 2000). The SCID-I assesses Axis I mood, anxiety, substance use, eating, somatoform, and psychotic disorders. The SCID-II assess Axis II personality disorders according to the DSM-IV-TR; this study utilized the SCID II for Borderline Personality Disorder (BPD) section only, as BPD is considered a disorder primarily of emotion dysregulation (Linehan, 1993) and thus a potentially relevant diagnosis for the population of interest.

*Depression, Anxiety, and Stress Scale-21-item version* (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report measure adapted from a 42-item measure of depression, anxiety and stress symptoms that are specifically designed to distinguish between symptom clusters. The scale is scored on three subscales: Depression (e.g. "I felt downhearted and blue"), Anxiety (e.g. "I felt scared without any good reason"), and Stress (e.g. "I found it difficult to relax"). All three subscales have been found to have good-to-excellent internal consistency (Antony, Bieling, Cox, Enns, & Swinson, 1998).

*Dialectical Behavior Therapy Ways of Copying Checklist* (DBT-WCCL; Neacsiu et al., 2010) is a 59-item self-report measure of DBT skills use with two subscales: one

assessing coping via DBT skills use and one assessing coping via dysfunctional means. An initial study found that the scale has good-to-excellent psychometric properties and that the DBT skills use subscale successfully discriminated patients who received skills training versus those that did not (Neacsiu et al, 2010).

*Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004) is a 36item self-report measure of problems regulating emotions across a variety of dimensions, including impulse-control, awareness and understanding of emotions, acceptance of emotions, and ability to engage in strategies that regulate emotions. Items are rated on a 5-point Likert scale to indicate how applicable statements are to the individual from 1 ("almost never," 0-10%) to 5 ("almost always," 91-100%). There is no clinical cut-off score, but the total score is used to indicate overall difficulty-level of emotion regulation with higher scores indicating more difficulty. The DERS demonstrated excellent internal consistency (Cronbach's  $\alpha$ =.93) and good test-retest reliability with other measures of emotion dysregulation and emotional avoidance in a study of undergraduates at a major university, and adequate predictive validity of self-reported behavioral outcomes related to emotion regulation problems such as self-harming behaviors (Gratz & Roemer, 2004).

*Five Facet Mindfulness Questionnaire Scale* (FFMQ; Baer et al., 2006) is a 39item self-report measure of the five constructs that appear to make up mindfulness, using a 5-point Likert scale. The measure has five subscales that measure skills cultivated by the practice of mindfulness: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. The measure has adequate-toexcellent internal consistency ( $\alpha$ = .75 to .92; Baer et al., 2008). Positive Affect and Negative Affect Schedule-Expanded Version (PANAS-X; Watson & Clark, 1999) is a 60-item self-report that measures the higher order constructs of positive and negative affect as well as subscales measuring four negative emotions, three positive emotions, and four "mixed" emotions. The constructs were factor analytically-derived. Individuals rate on a scale from 1 (*very slightly or not at all*) to 5 (*extremely*) the extent to which they have felt a number of emotions (e.g. cheerful, strong, disgusted, irritable, angry) in the past few weeks. All subscales have demonstrated adequate-to-excellent internal consistency, with *General Positive Affect* and *General Negative Affect* demonstrating excellent internal consistency ( $\alpha$ =.90 to .91; Watson & Clark, 1999).

*Work and Social Adjustment Scale* (WSAS; Mundt et al., 2002) is a 5-item selfreport measure of impaired functioning across occupational and social functioning that was adapted to attribute causality of impairment to problems with emotions. The WSAS has been found to be a reliable and valid measure of impaired functioning, with internal consistency ranging from .70 to .94 and test-retest correlation of .73 (Mundt et al., 2002). *Analysis Plan* 

At pre-treatment, we used a multivariate analysis of variance (MANOVA) to assess for differences between treatment conditions. We then used general linear modeling (GLM) to test for both an effect of time (pre-, mid-, post-treatment and followup) and of group (M+ER vs ER) on outcome measures. GLM was conducted by IBM Statistical Product and Service Solutions Version 20.0 (IBM SPSS 20.0; IBM Corp.). Data analyses were conducted both with the intent-to-treat (ITT) sample and with study completers. We continued to collect data on study drop-outs whenever possible. Because five participants completed the study but did not complete follow-up questionnaires, we decided to run separate GLM analyses for completers through post-treatment and completers through follow-up, in order to assess whether there was any significant differences between those who completed the study and also completed follow-up questionnaires and those who completed the study but were lost to follow up.

We chose to explore each GLM analysis individually per outcome measure because of the exploratory nature of the study. While a multivariate analysis would have been preferable to control for the number of analyses run, our sample size is so small that we consider our results primarily descriptive. In order to correct for running multiple analyses, we set the significance level at p < .01. Effect size was calculated using Cohen's *d* for a within-subjects design using the correlation between two means in order to correct for dependence, as per Morris and DeShon's (2002) equation 8. Small effect sizes are defined as .2, medium as .5, and large as .8 and above (Cohen, 1988). Effect sizes were calculated twice, using the means and standard deviations for outcome measures at pre-treatment and post-treatment as well as at pre-treatment and follow-up, in order to determine if there was any change in effect size between post-treatment and follow-up.

Multiple imputation was used for the ITT sample to generate ten different data sets with estimates of missing data. Multiple imputation allows for calculation of missing data separately, multiple times. Final statistical analyses are then conducted separately for each individual imputed dataset, and the results of the analyses are then averaged across imputed datasets. This process results in lower bias and standard error than if one works with a single imputed dataset (Acock, 2005). Standard error is divided across data sets, reducing overall bias. This technique accounts for random fluctuations that can occur around any single imputation (Schafer, 2007). While calculating three to five imputations is typically sufficient, we chose to impute the dataset ten times, as there is no drawback to higher numbers of imputations.

### CHAPTER III

#### Results

#### Pre-treatment

Based on scheduling requirements, 16 individuals were assigned to the M+ER condition and 8 individuals were assigned to ER-only condition. At pre-treatment, there were no significant differences between treatment conditions on outcome measures. Participants assigned to both conditions reported significant problems across measures of mood, functioning, and emotion regulation. The mean pre-treatment score on the DERS indicated substantial levels of emotion dysregulation among participants (M=121.83, SD=20.41), as the mean score was well above the inclusion cut-off score of 105. Participants' mean pre-treatment scores on the DASS-21 fell in the severe range for the depression subscale (M=25.75, SD=12.76), anxiety subscale (M=18.58, SD=11.56), and stress subscale (M=27.58, SD=9.99). Mean pre-treatment scores on the WSAS (M=25.88, SD=9.59) also indicated that problems with emotion regulation caused significant impairment in participants' abilities to function socially and in work and academic settings (Mundt et al., 2002). Participants met criteria for a range of disorders at the intake interview according to diagnostic interviews using the SCID-I and SCID-II for BPD only. Ten met criteria for current major depressive disorder, seven for generalized anxiety disorder, six for BPD, five for social phobia, three for specific phobia and dysthymic disorder, two for post-traumatic stress disorder (PTSD), and one each for bipolar II, obsessive-compulsive disorder, and panic disorder. As such, while participants might be considered higher functioning relative to a clinical population given their status

as undergraduates at a major university, they presented with clinically significant symptoms and impairment across a range of domains.

#### Attrition

Over the course of the eight weeks, three participants out of the initial 24 stopped attending. Of the three students who dropped out of the study before the final group session, one dropped out after the first session to enroll in an intensive outpatient substance abuse program, one left after three sessions to care for an ill family member, and one left after four sessions citing frustration and anxiety about juggling group sessions and academic workload as her reason for dropping out. We continued to collect data from those who dropped out whenever possible. At mid-treatment, 23 of 24 participants provided data (missing data was from the participant who dropped out after the first session of the study). At post-treatment, 21 of 24 participants provided data (missing data was for all three study drop outs). At follow-up, 17 of 24 participants provided data. Of the seven who did not provide follow-up data, five individuals had completed the skills training program. However, we did not collect follow-up data from the first cohort (four participants) and one study completer from the second cohort did not respond to repeated requests to complete the follow-up questionnaires. The other two participants who did not provide follow-up data were study drop-outs; one person who dropped out after three sessions did provide follow-up data (though not post-treatment data).

### Post-treatment and Follow-up

A significant effect of time but no significant effect of group was found across outcome measures for both the ITT sample and treatment completers. Because there were

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no differences in outcomes for the ITT sample and completers, we will report ITT data in this article (GLM results and means and standard deviations of treatment completers can be requested from the author). Raw means and standard deviations for each group at pre-, post-treatment, and follow-up are listed in Table 1. GLM analyses were first conducted to assess for an effect of time at mid-, post-treatment and follow-up and then to assess for any effect of treatment condition. Participants in both conditions made significant improvements over time across outcome measures, but there were no significant differences on outcome measures found between the M+ER and ER conditions. In addition, within-subjects Cohen's *d* effect sizes were found to be consistent for changes between pre-treatment and post-treatment and changes between pre-treatment and follow-up, so effect sizes reported in this article are those for statistically significant changes between pre-treatment and follow-up on outcomes measures. GLM results and effect sizes are listed in Table 2.

Participants in both conditions made significant gains in emotion regulation and reported improvements in affect over time. They demonstrated significantly reduced levels of emotion dysregulation with a large effect size, F(3,20)=23.805, p<.001, d=1.523. Mean DERS scores fell over thirty points from pre-treatment to post-treatment and gains were maintained at follow-up. Participants also made significant improvements on DASS-21 subscales for depression (F[3,20]=8.932, p<.001, d=.741) and stress (F[3,20]=11.249, p<.001, d=.643). While changes on the anxiety subscale scores between pre-treatment and follow-up were not statistically significant (F[3,20]=3.812, p=.015), mean scores fell from severe to moderate between pre-treatment and follow-up for each of the depression, anxiety and stress subscales, according to clinical cut-offs on the

DASS-21 (Lovibond & Lovibond, 1995). Of note, the only score on which a significant effect of group was found was the DASS-21 Stress subscale score. For the ITT sample, the ER participants reported lower stress scores (M=16.53, SD=11.05) than those in the M+ER condition (M=22.16, SD=9.00) at follow-up, (F[3,20]=5.728, p=.002). On more general measures of affect captured by the PANAS-X, participants in both conditions also reported clinically significant improvements in overall positive affect and reduction in overall negative affect as measured by the Total General Positive Affect scores (F[3,20]=9.990, p<.001, d=1.081) and Total General Negative Affect scores (F[3,20]=7.229, p<.001, d=.885). No significant effect of group was found on measures of affect aside from the aforementioned DASS-21 Stress subscale.

Participants also reported significant increases in use of coping skills and mindfulness practice, and improvements on functioning across work, school and social domains. Total mindfulness scores on the FFMQ improved significantly for participants in both conditions with a large effect size (F[3,20]=51.654, p<.001, d=1.968). These changes indicate increased use of behaviors that are considered the primary constructs of mindfulness. Participants also reported utilizing more DBT skills to cope with problems in their daily lives according to ratings on the DBT-WCCL (F[3,20]=22.832, p<.001, d=1.260). Improvements in functioning in work, academic and social domains as reported on the WSAS were also statistically significant with a large effect size (F[3,20]=14.262, p<.001, d=1.318). Whereas mean WSAS scores at pre-treatment exceeded the cut-off score of 20 consistent with moderately severe psychopathology, mean scores at follow-up fell below this cut off (M=16.35, SD=7.97).

### CHAPTER IV

#### Discussion

This study aimed to investigate the feasibility and efficacy of abbreviated DBT group skills training for undergraduates with problems related to emotion regulation, as well as to assess whether there is an additive benefit of mindfulness skills training when combined with emotion regulation skills training. Abbreviated skills training for emotion dysregulation may successfully improve functioning and reduce problematic emotions in an undergraduate population, as demonstrated by the significant gains across outcome measures for study participants in both treatment conditions. Our first hypothesis, which was that study participants would demonstrate improvements across outcome measures, was confirmed. Participants reported decreased scores on measures of emotion dysregulation and negative affect and improvements on scores of positive affect, work and social functioning, DBT skills use, and mindfulness. Results were consistent across ITT and completer analyses and effect sizes for within-subjects changes from pretreatment to follow-up were primarily large. In addition, attrition was relatively low and the program was well-received by participants according to written feedback collected at post-treatment. However, our second hypothesis was not confirmed, which was that participants in the M+ER group would demonstrate greater improvement in emotion regulation, mood ratings, skills use, and social and occupational functioning. Instead, we found no significant effect of treatment group across outcome measures, with the exception that participants in the ER-only group reported significantly greater decreases

in ratings of Stress on the DASS-21 subscale at follow-up than those in the M+ER condition.

### Feasibility

Given that a primary aim was to assess the feasibility of short term DBT skills training in a college setting, due to the unique scheduling constraints of a semester calendar and diversity of daily schedules amongst students, the fact that attrition was quite low and that participants provided very positive feedback at post-treatment is noteworthy. We had anticipated higher attrition due to issues such exams or social and extracurricular conflicts, but 21 of 24 participants completed the eight week skills training. Students responded at post-treatment with a number of positive comments about the program. One student wrote, "I enjoyed the skills that we were working on and though they were difficult and hard to grasp at first sight, I think they will be really important to reduce these negative emotions in my mind." Another wrote, "I do feel more in control of my emotions compared to before the group." And finally, a participant wrote, "The group has drastically changed the quality of my life... I think about and use at least one of the skills we learned in this group every day... This week I have been presented with many difficult situations happening at the same time, and the same will hold true for next week, but I have been much more able to cope with these situations using my new skills than I would have been a few months ago!" Constructive feedback primarily focused on the desire for larger groups ("A larger group might have been more effective") and extra skills review sessions ("Maybe a few extra review sessions would have been good to finish the group off... Helpful skills, though I do need more

practice."). Both are valid points that relate directly to issues of recruitment and time limitation in a campus setting.

While low attrition and positive feedback are positive indicators of the feasibility of abbreviated DBT skills training in college settings, we encountered significant difficulties with recruitment that may prove to be impediments to implementing similar treatments in comparable settings. The university at which the study was conducted enrolls approximately 30,000 undergraduate students and yet a number of obstacles made recruiting a large number of participants extremely challenging. Scheduling conflicts and transportation challenges prevented a number of potential participants from enrolling in the study. Because students may take courses at any time of day from early morning until late evening and may also participate in a range of extracurricular activities, it was impossible to identify a time at which the majority of participants were available. In addition, the university is geographically large and subdivided into four campuses that require bus or car transport in between. Travel between campuses is time consuming, exacerbating the problem of limited schedule availability and likely serving as a deterrent for potential participants who lived or studied on campuses other than the one on which the study was conducted.

We also had great difficulty in advertising the study to potential participants. There is no single university forum through which to advertise treatment studies to all undergraduates. A variety of recruitment methods were used, including referrals through the university counseling center, campus-wide flyers, emails to undergraduate general psychology courses, and flyers distributed at campus dorms. Despite these methods, only 91 students on a campus of 30,000 called to inquire about the study. It is possible that the vast majority of the student body did not receive emails or view flyers advertising the study. Potential participants also may have been dissuaded by the stigma that can accompany psychotherapy (Mowbray et al., 2006). We also did not advertise that study participants would be compensated for completing study questionnaires. A larger number of students may have expressed interest if compensation had been mentioned on flyers. However, we aimed to identify those students who sought treatment for the sake of emotion regulation problems rather than for material incentives, and so chose to omit compensation information. Another important factor that negatively impacted both recruitment and enrollment was the narrow window of time in which to recruit participants and conduct the study due to the semester system, academic vacations, and exam schedule. While we began flyering about two months in advance of skills group initiation, winter break interrupted this period and we were left with about three weeks with which to recruit and complete intakes with potential participants.

#### *Within-Subjects Efficacy*

Participants in both treatment groups demonstrated significant improvements in affect and functioning. It appears that even a short-course of module-specific DBT skills training may be an impactful way to improve problems related to emotion dysregulation. While the sample size was small, improvements were statistically significant and effect sizes were large across measures. The majority of participants would not have met inclusion criteria for the study (a score greater than 105 on the DERS) at post-treatment and follow-up. In addition, as the M+ER condition did not outperform the ER condition, it is conceivable that an even briefer intervention (say, six weeks of emotion regulation skills training) would have a similar impact, given that the emotion regulation skills content in the M+ER condition was limited to six weeks, whereas the same content was spread out over eight weeks in the ER-only condition. Other populations with similar scheduling issues and demands might make similar gains if they had the opportunity to complete a similar, short-course of group treatment. This also points to the feasibility of implementing impactful treatments that requires relatively few resources. Providing DBT skills training in a group format for two months or less requires relatively few financial costs or staffing resources, and may pay off in terms of improved academic and/or work performance for undergraduates. Participants were neither required nor prohibited from participating in individual therapy during the study, so it is difficult to rule out any positive impact that may be attributable to external resources, but a number of participants participated in no other form of treatment and still made gains. For universities and other settings facing increasingly small allocations of money for mental health services, abbreviated skills training in group formats may be an effective way to improve mental health outcomes on campus while preserving resources.

### Between-Group Differences

Our hypothesis that mindfulness skills training would have an additive benefit was not supported in the study, as there were no significant differences between treatment conditions on outcome measures, with the exception that the ER-group outperformed the M+ER group on reductions in Stress scores. It is possible that there is not an additive benefit of mindfulness skills training for emotion dysregulation in the context of an abbreviated, eight-week course of treatment in a college setting. Traditionally, DBT is conducted over six months to one year and, as such, it may be that dedicating just two hours over two weeks to mindfulness skills training is insufficient to have a positive impact and lead to measurable improvements in participant outcomes. This study's findings should not be misconstrued as an implication of the lack of efficacy of mindfulness in treating problems related to emotion regulation. In fact, there is a substantial amount of research evidencing the efficacy of mindfulness in reducing depressive and anxiety symptoms (Chiesa & Serretti, 2010; Coelho, Canter & Ernst, 2007; Hofmann, Sawyer, Witt & Oh, 2010). However, studies on mindfulness-based approaches typically investigate treatment over several weeks to several months. A recent meta-analysis investigating the efficacy for mindfulness-based interventions on depressive symptoms included interventions that ranged from 7 to 24 sessions (Klainin-Yobas, Cho, & Creedy, 2012). The two sessions devoted to mindfulness in our study is significantly less than in most interventions and was most likely insufficient for adequate skills acquisition. Of course, it is also may be that our study's small sample size and unequal participant distribution to conditions may have resulted in insufficient power to detect a significant effect of mindfulness, should there have been one. However, if in fact there was no additive benefit of mindfulness in this study, it is possible that DBT emotion regulation skills training alone provides a greater positive impact in a short period of time when targeting problems of emotion dysregulation, and hence, 'more bang for the buck.' Limitations

Limitations of the study include lack of a no-treatment control condition, nonrandomized design, small sample size, unequal distribution of participants to treatment conditions, and reliance on self-report data. We chose to proceed without a control condition because of the substantial evidence-base for DBT skills as a comprehensive package. However, without a control condition we are unable to attribute all improvements on outcomes to the treatment with complete confidence and must acknowledge that other factors, such as the passage of time or variations in academic workload, may have impacted participant outcomes. The small sample size was largely due to the pilot nature of the study and the significant difficulties encountered in recruitment of participants. The small sample size reduces power to detect an impact of condition, and we did not in fact find a difference between treatment conditions. While we had originally intended to use random assignment to place participants in a treatment condition, scheduling conflicts between potential participants and transportation challenges made random assignment impossible. It was necessary to assign participants to a treatment condition based on scheduling availability in order to maximize participation. This strategy also resulted in an unequal distribution of participants in treatment conditions, such that twice as many participants initially enrolled in the M+ER condition (n=16) than the ER condition (n=8), again due to scheduling preferences. In addition, outcome measures were collected via self-report, which may have reduced the validity of responses; in self-report, participants may over- or under-report their experiences or be influenced by the intensity of the emotion present at the time of questionnaire completion.

### Recommendations for Future Investigation

Further investigation is warranted to both address the limitations of this study and to explore ways to address the problems with feasibility encountered in this study. Of course, additional studies with larger sample sizes, control conditions, and random assignment are necessary to replicate these findings and determine if our findings are reliable. In addition, future studies in college settings may wish to experiment with ways to increase recruitment and enrollment. Perhaps offering treatment in a variety of locations and at various times of day would enhance treatment participation, although limited resources in terms of time, space, and staffing may make this difficult. In addition, improved collaboration with a university counseling center when conducting a treatment study may facilitate greater referrals and thus larger enrollment. While we met with counselors at the university counseling center to explain our study and we requested that they provide study information to students who might meet eligibility criteria, the number of referrals that we received was low, perhaps due to confusion about eligibility or due to other treatment options at the center. Perhaps collaboration with the counseling center staff in the provision of treatment would have increased the number of referrals.

In addition, further investigation is required to investigate the impact of different DBT skills modules and DBT components. As there are four DBT skills modules, it would eventually be of interest to investigate each independently and comparatively in order to determine which modules provide the active ingredients for change both in comprehensive DBT and in skills training alone. In addition, further exploration of shortterm interventions utilizing mindfulness may be warranted to determine the minimum duration of an intervention necessary to provide a measurable, positive impact of the mindfulness skills training.

### Conclusion

In summary, this study suggests that abbreviated DBT skills training, and specifically the emotion regulation skills module, may be an effective intervention targeting emotion dysregulation in undergraduates. Participants in both the M+ER and

ER-only conditions demonstrated significant gains with large effect sizes across measures of emotion regulation, affect, skills use, mindfulness, and work and social functioning. Gains were maintained at four-week follow-up. Low attrition and positive feedback also point to the acceptability of this intervention in a college setting. An additive benefit of mindfulness skills training was not found, as there were no between group differences. As such, two weeks of mindfulness skills training may be insufficient to have a measurable impact, although further investigation is warranted. Significant difficulties were found in the recruitment and enrollment of participants due to scheduling and transportation constraints, and may have negative implications for the feasibility of implementing similar interventions at other universities.

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	P	re	Mid (4	1 wks)	Post (8	3 wks)	Foll	ow-up (12 wks)
Measure	M	SD	M	SD	M	SD	M	SD
DERS	121.83	20.41	106.23	25.58	88.29	24.88	88.97	24.01
M+ER	120.31	23.16	102.03	27.71	83.16	26.54	87.49	25.04
ER	124.88	14.27	114.63	19.60	98.54	18.55	91.92	23.13
DASS-21 Depression	25.75	12.76	19.33	12.26	15.88	10.84	16.89	10.59
M+ER	23.63	14.33	16.25	12.59	14.34	11.31	17.75	10.96
ER	30.00	8.00	25.50	9.43	18.97	9.77	15.16	10.27
DASS-21 Anxiety	18.58	11.56	18.92	9.44	15.34	8.39	13.54	9.54
M+ER	17.86	12.55	16.89	9.44	15.66	8.57	14.92	8.24
ER	20.00	9.91	23.00	8.55	14.69	8.55	10.78	11.82
DASS-21 Stress	27.58	9.99	24.52	9.60	19.64	9.59	20.28	9.88
M+ER	25.13	9.80	21.53	8.99	19.12	9.47	22.16	9.00
ER	32.50	9.00	30.50	8.26	20.68	10.40	16.53	11.05
PANAS-X General Positive Affect	25.17	8.23	30.46	8.56	30.80	8.39	32.04	7.61
M+ER	25.88	8.24	31.50	8.62	30.34	8.16	31.68	7.73
ER	23.75	8.60	28.38	8.58	31.71	9.32	32.76	7.81
PANAS-X General Negative Affect	34.67	9.20	33.82	10.12	30.12	12.31	27.45	7.90
M+ER	34.13	10.18	31.67	10.77	30.10	10.87	26.81	8.12
ER	35.75	7.36	38.13	7.49	30.18	15.62	28.72	7.79
FFMQ	90.67	17.81	99.34	7.49	111.14	18.45	122.5	19.66
M+ER	91.81	17.87	101.70	18.88	112.01	20.27	Ĩ23.1	21.52
ER	88.38	18.69	94.63	14.27	109.40	15.25	Í21.3	16.54
DBT-WCCL DSS (Skills Use)	1.07	0.65	1.70	0.56	1.83	0.59	Ī.94	0.53
M+ER	1.17	0.69	1.73	0.50	1.85	0.51	1.97	0.47
ER	0.86	0.53	1.63	0.68	1.81	0.75	1.89	0.64
WSAS	25.88	9.59	22.15	9.30	17.33	9.71	16.35	7.97
M+ER	25.38	10.06	20.59	10.64	17.95	11.24	16.80	8.58
ER	26.88	9.16	25.25	5.01	16.10	5.99	15.45	6.99

Table 1Means and Standard Deviations Over Time with the ITT Sample

Note. Bolded numbers are for means and standard deviations of all participants in both conditions.

Table 2	
GLM Results	and Effect Sizes

Measure	F	р	$d^{l}$
DERS			
Time	23.805	0.000*	1.523
Time x Group	0.764	0.520	
DASS-21 Depression			
Time	8.932	0.000*	0.741
Time x Group	2.422	0.079	
DASS-21 Anxiety			
Time	3.821	0.015	0.361
Time x Group	1.698	0.181	
DASS-21 Stress			
Time	11.249	0.000*	0.643
Time x Group	5.728	0.002**	
PANAS-X General Positive Affect			
Time	9.990	0.000*	1.081
Time x Group	1.245	0.320	
PANAS-X General Negative Affect			
Time	7.229	0.000*	0.885
Time x Group	1.102	0.360	
FFMQ			
Time	51.654	0.000*	1.968
Time x Group	0.365	0.779	
DBT-WCCL DSS (Skills Use)			
Time	22.832	0.000*	1.260
Time x Group	0.579	0.641	
WSAS			
Time	14.262	0.000*	1.318
Time x Group	1.412	0.264	

*Note.* <sup>1</sup>*Cohen's d* was calculated for within-subjects changes between pre-treatment and follow-up p < .001; p < .01



Figure 1. DERS estimated marginal means for time x group.



*Figure 2.* DASS-21 Depression subscale estimated marginal means for time x group.



Figure 3. DASS-21 Anxiety subscale estimated marginal means for time x group.



Figure 4. DASS-21 Stress subscale estimated marginal means over time.



*Figure 5.* PANAS-X General Positive Affect estimated marginal means for time x group.



*Figure 6*. PANAS-X General Negative Affect estimated marginal means for time group.

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Figure 7. FFMQ estimated marginal means over time.



Figure 8. DBT-WCCL Skills Use Subscale estimated marginal means over time.



Figure 9. WSAS estimated marginal means over time.