



Published in final edited form as:

Behav Res Ther. 2014 February ; 53: 47–54. doi:10.1016/j.brat.2013.12.004.

Impact of Dialectical Behavior Therapy versus Community Treatment by Experts on Emotional Experience, Expression, and Acceptance in Borderline Personality Disorder

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Abstract

Evidence suggests that heightened negative affectivity is a prominent feature of Borderline Personality Disorder (BPD) that often leads to maladaptive behaviors. Nevertheless, there is little research examining treatment effects on the experience and expression of specific negative emotions. Dialectical Behavior Therapy (DBT) is an effective treatment for BPD, hypothesized to reduce negative affectivity (Linehan, 1993a). The present study analyzes secondary data from a randomized controlled trial with the aim to assess the unique effectiveness of DBT when compared to Community Treatment by Experts (CTBE) in changing the experience, expression, and acceptance of negative emotions. Suicidal and/or self-injuring women with BPD ($n = 101$) were randomly assigned to DBT or CTBE for one year of treatment and one year of follow-up. Several indices of emotional experience and expression were assessed. Results indicate that DBT decreased experiential avoidance and expressed anger significantly more than CTBE. No differences between DBT and CTBE were found in improving guilt, shame, anxiety, or anger suppression, trait, and control. These results suggest that DBT has unique effects on improving the expression of anger and experiential avoidance, whereas changes in the experience of specific negative emotions may be accounted for by general factors associated with expert therapy. Implications of the findings are discussed.

Keywords

Dialectical Behavior Therapy; Borderline Personality Disorder; Emotion; Anger; Experiential Avoidance; Shame; Guilt; Anxiety

Borderline personality disorder (BPD) is a severe psychological disorder, marked by a pervasive pattern of instability in interpersonal relationships, self-image, affect, and behavior (American Psychiatric Association, 2013). The severity of the disorder is indicated by its chronicity (Widiger & Weissman, 1991), comorbidity (Lieb, Zanarini, Schmahl,

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Linehan, & Bohus, 2004), lethality (Linehan, Rizvi, Shaw-Welch, & Page, 2000), high treatment utilization (Bender et al., 2001), and poor treatment outcomes (Gunderson, et al., 1989; Rizvi, 2011). People diagnosed with BPD frequently engage in various types of impulsive and self-damaging behaviors, such as suicide attempts, self-harm, or substance abuse (Lieb, Zanarini, Linehan, & Bohus, 2004; Soloff, Lis, Kelly, Cornelius, & Ulrich, 1994). These behaviors often function as maladaptive strategies used to achieve short-term relief from intense negative emotions (Brown, Comtois, & Linehan, 2002; Chapman, Gratz, & Brown, 2006; Linehan, 1993a). Indeed, the biosocial theory hypothesizes that people with a BPD diagnosis have a biologically based emotional vulnerability characterized by high emotional sensitivity and reactivity and a slow return to baseline (Linehan, 1993a; Crowell, Beauchaine, & Linehan, 2009).

Research has offered partial support for this theory. A review of the literature on BPD and emotional distress found that people diagnosed with BPD consistently report having more intense emotions, having greater reactivity to emotionally evocative stimuli, and experiencing greater affective instability than controls. Findings were nevertheless mixed when behavioral and psychophysiological indices of emotional responding (as opposed to self report) were used. Some indices of emotional distress (e.g., heart rate) did offer support for greater emotional reactivity and a propensity towards experiencing more negative affect, while other indices (i.e., skin conductance response) refuted this hypothesis (Rosenthal et al., 2008).

Follow up studies continue to bring support in favor of heightened negative affectivity in BPD, while offering a mixed picture with regards to reactivity. Newer evidence suggests that people with a BPD diagnosis indeed report experiencing high levels of baseline negative emotion relative to controls although heightened reactivity in the presence of emotional stimuli was not found (Kuo & Linehan, 2009). In an electrophysiological study, people with a BPD diagnosis evidenced enhanced cortical reactivity to unpleasant emotional stimuli when compared to a control group (Marissen, Meuleman, & Franken, 2010). Furthermore, when compared to non-clinical controls and matched schizotypal personality disorder controls, adults diagnosed with BPD showed greater activation in the amygdala (an area related to emotional reactivity) when being shown emotional but not neutral pictures (Hazlett et al., 2012). In addition, the activation in the amygdala took longer to return to baseline in the BPD group (Hazlett, et al., 2012). Thus, while additional research is needed to better understand the mixed findings on emotional reactivity, heightened experience of aversive emotions is clearly a common feature in BPD and thus should be an important target in BPD treatments.

Difficulties with heightened negative affect do not pertain to a single emotion. Experiencing intense anger and difficulty controlling anger expression are part of the diagnostic criteria for BPD (American Psychiatric Association, 2013) and exaggerated anger responses are commonly reported among adults with a BPD diagnosis (Clarkin, Widiger, Frances, Hurt, & Gilmore, 1983; Gardner, Libenluft, O'Leary, & Cowdry, 1991; Koenigsberg et al., 2002). In addition, up to 95% of BPD outpatients report comorbid emotional disorders (i.e., mood and anxiety disorders; Harned et al., 2008). Furthermore, shame is a common and persistent emotion in BPD (Rizvi, Brown, Bohus, & Linehan, 2011; Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2010), and heightened levels of guilt have also been associated with BPD (Rüsch et al., 2007).

Experiential avoidance, including avoidance of experiencing emotions, also appears to be particularly problematic for people diagnosed with BPD. For example, BPD participants report more avoidance-oriented response patterns in coping inventories than non-BPD counterparts (e.g., Bijttebier & Vertommen, 1999) and score higher on a measure of

experiential avoidance than do non-clinical controls or anxious participants (Rüsch et al., 2006). Furthermore, chronic suppression of negative thoughts was shown to mediate the relationship between borderline personality features and negative affect (Rosenthal, Cheavens, Lejuez, & Lynch, 2005).

Heightened negative affectivity and problematic emotional expression are not only distressing to people diagnosed with BPD, but also lead to behavioral dyscontrol. Shame has been found to predict recurrence of self-injurious behavior in women diagnosed with BPD (Brown, Comtois, & Linehan, 2002). Comorbid anxiety disorders (Pagura et al., 2010; Sareen, 2011) and heightened aggression (Evren, Cinar, Evren, & Celik, 2011) increase the odds for suicidal behavior in a variety of clinical presentations, including BPD. In medical settings, when compared to non-BPD controls, BPD patients display more disruptive behaviors that are indicative of dysregulated anger (yelling, screaming, threatening, etc; Sansone, Farukhi, & Wiederman, 2011). We found no studies assessing the relationship between guilt and behavioral dyscontrol in BPD, nevertheless in general samples guilt has been linked to reduced self-control (Hofmann & Fisher, 2012).

Efforts to suppress and avoid painful private experiences (i.e., experiential avoidance) may actually be a key variable that explains the link between negative affect and the self-destructive behaviors seen in BPD. Experiential avoidance exacerbates negative affect in the long-term (Cioffi & Holloway, 1993; Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Marx & Sloan, 2002), leads to reliance on maladaptive strategies for reducing emotional intensity (Kashdan, Barrios, Forsyth, & Steger, 2006) including self-harming behaviors (Chapman, Gratz, & Brown, 2006), and makes progress in treatment more difficult (Berking, Neacsiu, Comtois, & Linehan, 2009).

Therefore, changing experiential avoidance and attempting to reduce maladaptive experience and expression of anger, anxiety, shame, and potentially guilt should be key targets in treating people diagnosed with BPD as they could improve the internal experience of BPD clients thus contributing to reduced behavioral dyscontrol. While reducing the intensity of negative affect may be a difficult target because of its biological basis, changing how BPD patients respond to these emotions both in terms of acceptance and expression is a promising target for psychological treatments.

Dialectical Behavior Therapy (DBT; Linehan, 1993a, 1993b), is a cognitive behavioral treatment for BPD with substantial empirical support (Kliem, Kroger, & Kosfelder, 2010; Leichsenring, Leibing, Kruse, New, & Leweke, 2011). DBT is an emotion-focused treatment that is designed to improve emotional experience and expression and reduce experiential avoidance in people diagnosed with BPD. DBT includes a dialectical balance of accepting versus changing problematic emotions as a way to directly target emotional distress. This is accomplished through teaching clients how to decrease emotional vulnerability, regulate and change emotions, and accept and allow emotions to be experienced more fully. Teaching on emotions and emotion regulation is done directly through didactic presentation of skills and indirectly through formulating problems as emotion-related, attending to the client's in-session emotions, and modeling emotional awareness, acceptance and regulation (Linehan, 1993a). An important question that still needs to be addressed more fully is whether this focus within DBT on emotion indeed results in improved emotional experience, expression, and acceptance in BPD clients.

Research has consistently shown that DBT is effective in reducing anger, with some studies finding that it is superior to treatment as usual (TAU; Linehan, Heard, & Armstrong, 1993; Evershed et al., 2003; Shelton, Kesten, Zhang, & Trestman, 2011; Koons et al., 2001; Koons et al., 2006; Soler et al., 2009), with a few exceptions (Linehan et al., 1999; Bohus et al.,

2004), but performs similar to other treatments specifically designed for BPD (McMain et al., 2009, Clarkin, Levy, Lenzenweger, & Kernberg, 2009), with one exception (Turner, 2000).

Likewise, evidence suggests that DBT is generally effective in reducing anxiety, although findings supporting that DBT outperforms other treatments are mixed. Some studies (Bohus et al., 2004) but not others (Turner, 2000; Koons et al., 2006) indicate that DBT is superior to TAU in reducing anxiety among people with a BPD diagnosis or with severe mental illness. When compared to an active control, DBT has been found equally effective to CTBE (Harned et al., 2008) in leading to diagnostic remission from anxiety disorders, and more effective in anxiety reduction than a supportive therapy group (Soler et al., 2009). To our knowledge, no study of DBT has included shame or guilt as an outcome, nor has any study examined the differential effect of DBT on experiential avoidance.

The present study is part of a larger program of research comparing DBT with a rigorous control condition (community treatment by experts, or CTBE) designed to control for potential threats to internal validity (e.g., expertise, allegiance). Findings from the main outcome study indicate that DBT has unique effects that extend beyond those of non-behavioral expert therapy in reducing suicide attempts, medical severity of suicidal and self-harming acts, use of crisis services, inpatient hospitalizations, and treatment drop-out (Linehan et al., 2006). Using data from the Linehan and colleagues (2006) study, the present study examines secondary outcomes related to the experience and expression of negative emotions, including experiential avoidance, anger expression, and the specific emotions of anger, anxiety, shame, and guilt among suicidal and/or self-injuring women diagnosed with BPD. We examined two hypotheses: 1) the experience, expression, and acceptance of negative emotions would significantly improve over time regardless of the treatment provided, and 2) DBT would result in significantly greater improvements in these outcomes when compared to CTBE.

Method

Participants

Participants were 101 women between the ages of 18 and 45 ($M = 29.3$; $SD = 7.5$) who met criteria for BPD on both the International Personality Disorders Examination (Loranger, 1995) and the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (First, Spitzer, Gibbons, Williams, & Benjamin, 1996). Participants were also required to have engaged in recent and recurrent intentional self-injury, which was defined as having at least two suicide attempts or self-injurious episodes in the past five years and at least one in the past eight weeks. Exclusion criteria were: 1) lifetime diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, psychotic disorder not otherwise specified, or mental retardation, 2) a seizure disorder requiring medication, 3) a mandate to treatment, and 4) the need for primary treatment for another debilitating condition.

Participants were primarily Caucasian (88%), not married (87.1%), and did not have a college degree (76.2%). The most prevalent lifetime Axis I comorbidities were major depressive disorder (94.2%), anxiety disorders (90.4%), and substance use disorders (78.8%). Detailed demographic information is described elsewhere (Linehan et al., 2006). All participants provided informed consent, and the University of Washington Human Subjects Division approved all protocols.

Procedures

Participants were randomly assigned to DBT ($n = 52$) or to CTBE ($n = 49$) using an adaptive minimization randomization procedure that matched participants on five prognostic

variables (see Linehan et al., 2006). Baseline assessments occurred before participants were informed of their treatment assignment, and outcome assessments occurred at 4-month intervals through the 1-year treatment and 1-year follow-up period. Blinded, independent clinical assessors conducted all assessments.

The study was conducted in two cohorts (Cohort 1, $n = 63$ and Cohort 2, $n = 38$). A number of measures were administered only to the first cohort and were removed from the assessment battery for the second cohort. One measure became available part way through recruitment for Cohort 1 and was administered to part of this cohort as well as to Cohort 2. Therefore, some measures included in this analysis were given to Cohort 1 only and some to both cohorts.

Treatment Conditions

DBT—DBT is a cognitive-behavioral treatment targeting (among other conditions) people who meet criteria for BPD. DBT targets, in hierarchical order, life-threatening behaviors (e.g., suicide attempts and NSSI), behaviors that interfere with treatment delivery (e.g., noncompliance), and severe quality of life interfering behaviors (e.g., severe Axis I disorders). DBT consists of (a) weekly individual psychotherapy (1 hr/wk); (b) group skills training (2.5 hr/wk); (c) phone consultation (as needed); and (d) weekly therapist consultation team meeting.

CTBE—The CTBE condition was developed to control for expertise, treatment allegiance, availability of a clinical supervision group, prestige, general factors, assistance in finding a therapist, availability of affordable and sufficient treatment hours, therapist gender, training, and clinical experience. Community mental health leaders nominated CTBE therapists as experts in the treatment of difficult patients. CTBE therapists who self-identified as primarily cognitive or behavioral in orientation were excluded.

More details on the procedures and treatment conditions can be found elsewhere (Linehan et al., 2006). Participants in the two conditions did not differ on demographic variables or diagnostic characteristics.

Measures

State-trait anger expression inventory (STAXI)—The STAXI (Spielberger, 1988) is a widely used self-report measure for anger. Anger is measured across four different dimensions, corresponding to separate subscales that assess the disposition to experience anger (Anger Trait), the frequency with which anger is suppressed (Anger In), the frequency with which anger is expressed (Anger Out), and the amount of perceived control over anger (Anger Control). The STAXI has been shown to have good internal consistency and construct validity (Spielberger, 1988). The STAXI was given to both cohorts. Cronbach's α for the STAXI subscales at baseline were: Anger Trait (.88), Anger Out (.85), Anger In (.72), Anger Control (.87).

Acceptance and action questionnaire (AAQ)—The AAQ (Hayes et al., 2004) is a widely used self-report measure of experiential avoidance with good psychometric properties (e.g., Roemer, Salters, Raffa, & Orsillo, 2005). The AAQ defines experiential avoidance as unwillingness to remain in contact with particular private experiences, such as uncomfortable emotions, bodily sensations, or thoughts. Higher scores on the AAQ indicate more avoidance of private experiences, while lower scores indicate higher acceptance. The present study uses the 16-item version of the AAQ (Hayes et al., 2004). The measure was introduced partway through the study for Cohort 1 and was used for all of Cohort 2. The measure had acceptable internal consistency (Cronbach's $\alpha = .83$) at baseline.

Personal feelings questionnaire 2 (PFQ2)—The PFQ2 (Harder & Zalma, 1990), is a self-report 16-item adjective checklist with each item rated on a 4-point scale (0 = you never experience the feeling to 4 = you experience the feeling continuously or almost continuously). The PFQ2 contains a shame and guilt subscale. Shame items include descriptors such as "embarrassment," "self-consciousness," and "feeling laughable." Guilt items include "mild guilt" or "feeling you deserve criticism for what you did". The PFQ2 has a confirmed two factor structure, and adequate internal consistency, test-retest reliability, and construct validity. The PFQ2 was administered to the Cohort 1 only. Cronbach's α at baseline was .79.

Taylor manifest anxiety scale (TMAS)—The TMAS (Taylor, 1953) is a 28-item self-report measure of anxiety in which participants respond to each item by circling T (True of you) or F (Not true of you). The 28-item TMAS is a shorter version of the original 50-item scale. Sample items include: "At times I have been worried beyond reason about something that really did not matter" and "I am very confident of myself" (reverse coded). Test-retest scores for the TMAS-28 ($r = .84$) have shown the instrument to be stable over a one-month period (Taylor, 1953). The Total Anxiety score was calculated from the number of "True" responses to the anxiety items. The TMAS was given to Cohort 1 only; Cronbach's α at baseline was .73.

Data Analysis

A hierarchical linear modeling approach (HLM; Bryk & Raudenbush, 1992) was chosen to analyze the repeated measures data for the entire study (pre-treatment through 24-months at 4 months intervals). The differences in rates of change in variables of interest were compared for the two treatment groups: DBT and CTBE. For each outcome, hypotheses were tested by conducting an HLM analysis and examining the effect of time across conditions (hypothesis 1) and the effect of the interaction between time and condition (hypothesis 2). The main effects of time and condition, and the time by condition interaction were included in all models presented. For each analysis, four statistical tests will be presented: an F statistic that assesses the significance of the fixed effect of time and the interaction of intervention and time, two t -tests that assesses whether the estimated slope coefficient for each condition is significantly different than zero and a t -test that assesses whether the *difference* in estimated slope between conditions is different than zero. The overall effect for time, quantified by the F statistic, is formed by the statistical contrast providing equal weights to the two interventions.

For each HLM model appropriate covariance structures for random and repeated effects were analytically determined based on chi-square tests comparing indices of model fit (Verbeke, 1997) and variance between and within subjects was modeled through the addition of random and repeated effects (Gibbons, 1993). A restricted estimated maximum likelihood (REML) model was used to account for the missing data. We also implemented pattern-mixture models (Hedeker & Gibbons, 1997) to assess whether important slope estimates were dependent on missing data patterns (Hamer & Simpson, 2009) or cohort effects. To this aim, we classified two monotonic patterns of available data (treatment completers versus treatment drop-outs; Cohort 1 versus Cohort 2) and assessed the interaction of pattern with the main and the interaction effects in our analyses. To assess whether non-linear changes over time better explained the results we also conducted two additional statistical analyses for each outcome, one adding a quadratic time effect, and one modeling time using a $\ln(\text{time})$ function. There were no additional findings when the quadratic or log effect for time for each outcome was modeled; therefore, only the results of the linear models are presented. Effect sizes for each longitudinal analysis were computed using the formula provided by Feingold (2009) and interpreted using Cohen (1988)'s

specifications. Observed power for these effect sizes was computed using Optimal Design (see Raudenbush & Liu, 2001).

Results

Preliminary Analyses

Two models (random intercept, random intercept and random slope) and several covariance structures were tested for fit for each outcome variable and the best fitting model is reported in Table 2. Two potential confounding factors were examined for each model: treatment drop out and cohort effects. A pattern mixture model was employed where the main effect of each confound, confound by time, and confound by time by condition were added to each HLM model. If the main effect or any of the interaction effects was significant we kept these terms in the analyses and excluded the non-significant predictors. Completing the intervention was assessed for all outcomes; cohort effects were assessed for the STAXI and AAQ, the only measures administered to both cohorts of participants.

There were no significant main effects of treatment drop out status, and there were no significant drop out by time, drop out by condition by time interaction effects for Experiential Avoidance, Anger In, Anger Out, Anger Control, Shame, or Guilt ($p > .05$), suggesting that drop out status did not play a significant role in these outcomes. For Anger Trait, there was a significant drop out (yes/no) by time interaction, which was included in the main Anger Trait analyses, $F(1, 98.89) = 4.40, p < .05$; there was no significant main effect of drop out, or significant time by condition by drop out interaction effect, $F(1, 98.65) = 0.16, p = .69$; $F(1, 90.28) = 0.51, p = .48$, respectively.

There were no significant main effects of cohort, and no significant cohort by time or cohort by condition by time interaction effects for any of the Anger, Shame, or Guilt variables ($p > .05$). For Experiential Avoidance, there was a significant cohort by time interaction, which was included in the main analyses, $F(1, 78.79) = 11.83, p < .001$. The main effect of cohort and the cohort by time by condition interaction effect were not significant predictors of Experiential Avoidance, $F(1, 77.20) = 0.24, p = .63$; $F(1, 77.79) = 1.58, p = .21$, respectively.

Primary Analyses

Descriptive data and sample sizes for all outcome measures at each assessment point are provided in Table 1. Table 2 summarizes the HLM results related to model and slope coefficient.

Anger—Analyses with the STAXI subscales (Anger In, Anger Out, Anger Control, Anger Trait) indicated that, across both treatment conditions, a significant effect of time in treatment was found, $F(1, 81.50) = 59.70, p < .001$; $F(1, 92.80) = 12.46, p < .001$; $F(1, 89.48) = 9.44, p < .005$; $F(1, 101.33) = 35.91, p < .001$, respectively. These results suggest that, overall, participants significantly improved over time on the four anger variables.

A significant interaction between time and condition was found for Anger Out with DBT showing a significant reduction in anger expression whereas CTBE did not significantly change, $F(1, 92.80) = 4.87, p < .05, d = 0.31$, observed power = 0.30. Although no significant time by condition interaction was present for Anger Control, $F(1, 89.48) = 1.58, p = .21$, participants in DBT improved significantly, but participants in CTBE did not improve significantly in anger control ($d = 0.19$, observed power = 0.15, see Table 2).

There were no significant interaction effects for Anger Trait ($d = 0.13$; observed power = 0.10) and Anger In ($d = 0.31$; observed power = 0.29). Participants who dropped out of

treatment improved significantly more on Anger Trait scores than participants who completed treatment (Table 2).

Experiential avoidance—Analyses confirmed both hypotheses related to changes during treatment in experiential avoidance. A significant effect of time and a significant time by condition interaction effect were found, $F(1, 79.98) = 78.90, p < .001$; $F(1, 79.98) = 4.78, p < .05$, respectively. The difference in slope between DBT and CTBE indicates that experiential avoidance decreased at a faster rate in DBT than CTBE (Table 2, $d = 0.59$, observed power was 0.57). The second cohort of participants had a faster reduction of experiential avoidance than the first cohort, with the CTBE participants in cohort two not improving significantly over time.

Shame—For shame, a significant effect of time was found, $F(1, 55.63) = 22.95, p < .001$, but no significant condition by time interaction, $F(1, 55.63) = 0.23, p = .64, d = 0.13$, observed power = 0.07. The slope estimates for both DBT and CTBE conditions were significantly different from zero, indicating that both treatments resulted in significant improvements in shame (Table 2).

Guilt—For guilt, a significant effect of time, $F(1, 52.08) = 15.17, p < .001$, but no significant condition by time interaction was found, $F(1, 52.08) = 0.001, p = .98, d = 0.01$, observed power = 0.05. The slope estimates for both DBT and CTBE were significantly different from zero, which suggests that both treatments yielded significant improvements in guilt (Table 2).

Anxiety—Analyses confirmed a significant effect of time for anxiety, $F(1, 47.80) = 21.89, p < .001$, but no significant interaction, $F(1, 47.80) = 0.27, p = .60, d = 0.27$, observed power = 0.09. The slope estimates for both DBT and CTBE conditions were significantly different from zero, indicating that both treatments resulted in significant improvements in anxiety (Table 2).

Discussion

The current study examined two hypotheses in a sample of suicidal and self-injuring women with BPD: 1) the experience, expression, and acceptance of negative emotions would improve via treatment, and 2) DBT would lead to greater improvements in these outcomes than treatment by non-behavioral experts. Three major findings emerged from the analyses.

First, as hypothesized, both expert treatments for BPD led to significant improvements in all outcomes. These results suggest that emotional distress and experiential avoidance, often viewed as causing dysfunctional behaviors common to BPD, are likely to improve in any expert-administered treatment. This further implies that expert-administered BPD treatments may share common mechanisms of change that lead to improvement in emotion outcomes. For example, Badgio and colleagues (1999) propose that the acquisition of coping skills is a common pathway towards change in BPD for both cognitive and dynamic therapies. In support of this, Neacsu Rizvi and Linehan (2010) found that use of skills is a mechanism of change for primary outcomes (e.g., suicide attempts, self injurious behavior) across multiple treatments for BPD.

Second, no significant differences were found between DBT and CTBE in reducing the intensity of any specific negative emotion, including anger, anxiety, shame, and guilt. This suggests that improvements in the subjective experience of negative emotions may be due to common factors associated with expert therapy. Although this was contrary to our expectations, it is consistent with prior research indicating no differences between DBT and

CTBE in improving anxiety disorder diagnoses (Harned et al., 2008) as well as research showing no differences between DBT and other active BPD treatments in reducing anger (McMain et al., 2009, Clarkin, Levy, Lenzenweger, & Kernberg, 2009). It is possible that expert therapists focus comparably on reducing specific negative emotions among BPD clients regardless of theoretical orientation. For example, in a review of the contributions Freud made to psychodynamic psychotherapy, Clemens (2006) describes the importance of shame and guilt in maintaining suffering, and thus the importance of addressing these emotions in treatment. An interesting avenue for future research would be to evaluate whether the processes by which negative emotions are reduced differ across treatments, including specific in-session treatment strategies as well as potential mechanisms of change.

Third, DBT resulted in significantly greater improvements than CTBE in the expression of anger and experiential avoidance. In addition, the ability to control anger improved in DBT but not in CTBE, although the two treatments did not significantly differ on this outcome. Taken together, these findings suggest that DBT has unique effects on the expression of anger and acceptance of aversive private experiences (including negative emotions) that cannot be attributed to the effects of expert treatment. These findings are consistent with DBT's emphasis on reducing emotional suppression and avoidance, while simultaneously teaching patients how to experience and express negative emotions more effectively. This focus may be particularly critical given the fact that the overall intensity of specific negative emotions did not differ between treatments. Indeed, given that clients in both treatments had comparably intense (albeit reduced) negative emotions, it may be the enhanced ability to accept and express these emotions that accounts for DBT's superiority in reducing other primary outcomes, such as suicide attempts and crisis service use (Linehan et al., 2006). More generally, given the propensity toward emotional sensitivity and reactivity in BPD (Rosenthal et al., 2008), it may be the case that increasing BPD patients' ability to effectively experience these heightened emotions is critical to reducing any maladaptive behavior that functions to suppress or communicate negative emotion. Examining the potential mediating role of experiential avoidance and anger expression on behavioral outcomes in BPD treatment is an important avenue for future research.

It is important to also highlight that the present results were secondary outcomes from a treatment trial for suicidal and self-injuring women diagnosed with BPD. It is possible that different results would emerge in a less severe BPD population. For example, Soler and colleagues (2009) found a difference in reductions of anxiety and affect instability above and beyond treatment as usual in people diagnosed with BPD who were not at high risk for suicide. Therefore, an important future avenue for research may be to assess the effects of DBT on multiple indices of emotional experiencing and regulation with a less severe BPD population.

The results need to be interpreted in the light of some limitations. First, the number of participants to which some measures were administered was small. Therefore, future research involving larger samples is needed to replicate these findings. Second, direct assessments of emotion regulation and dysregulation were not used in this study. While measurements of emotional experiencing and acceptance are informative, the primary theoretical premise in DBT is linked to emotion dysregulation. Therefore, future studies should assess how DBT affects indices of emotion regulation, such as emotional awareness, emotional dysregulation, or use of emotion regulation strategies. Third, all the data included in the analyses were derived from self-report and future research would benefit from utilizing multi-modal assessment of emotional functioning, including psycho-physiological and neurobiological measures. Finally, given the low power and preliminary nature of this study, we did not make corrections for multiple testing.

To summarize, research on DBT has established it as an effective treatment for high-risk behaviors related to BPD, such as suicide attempts, non-suicidal self-injury, and substance dependence. This study extends prior research by beginning to examine the effects of DBT on the experience, expression, and acceptance of negative emotions. Results indicate that both DBT and CTBE are effective at improving these outcomes over the course of treatment, and the two treatments did not differ in their ability to reduce the intensity of any specific negative emotion. However, DBT outperformed CTBE in terms of improving BPD client's ability to approach private experiences and express anger effectively, which may account for DBT's efficacy in reducing high-risk behaviors that function to regulate negative emotions. Further research is needed to replicate and expand on these findings.

Acknowledgments

This research was supported by grants MH34486 and MH01593 from the National Institute of Mental Health to the last author. We thank the clients, therapists, assessors, and staff at the Behavioral Research and Therapy Clinics, without whom this research would not have been possible. We would also like to thank Dr. Robert Gallop for statistical consultation and feedback on the manuscript.

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Highlights

- We present secondary outcomes from a randomized controlled trial (RCT) for highly suicidal women
- The RCT compares dialectical behavioral therapy (DBT) to psychodynamic treatment by experts
- We examine changes in experiential avoidance, anger, anxiety, shame and guilt
- We find that both treatments lead to significant changes in all outcomes
- DBT lead to significantly more changes in experiential avoidance, anger expression

Table 1
Descriptive Statistics Based on Observed Values at Each Assessment Period for Each Outcome Measure

Measure	Stat	Pre treatment	4-Months	8-Months	12-Months	16-Months	20-Months	24-Months
AAQ	M	80.12	75.18	73.86	67.20	67.62	64.98	64.53
	SD	10.03	10.97	9.46	12.80	12.68	11.67	13.23
	N	33	38	36	41	42	40	45
DBT	M	78.94	79.60	76.62	74.52	68.09	71.13	69.85
	SD	12.50	11.33	12.41	12.68	12.98	14.88	13.08
	N	32	28	26	31	32	32	34
CTBE	M	2.19	2.04	2.02	1.84	1.95	1.89	1.90
	SD	0.75	0.46	0.66	0.51	0.49	0.53	0.43
	N	52	49	49	48	46	44	45
STAXI Out	M	1.99	1.95	1.80	1.93	1.82	1.99	1.89
	SD	0.59	0.57	0.56	0.57	0.42	0.61	0.52
	N	49	42	36	36	36	34	35
DBT	M	2.75	2.58	2.56	2.33	2.40	2.24	2.24
	SD	0.60	0.58	0.48	0.67	0.65	0.63	0.57
	N	52	49	49	48	46	44	45
CTBE	M	2.76	2.59	2.33	2.40	2.40	2.36	2.34
	SD	0.53	0.48	0.53	0.52	0.58	0.55	0.55
	N	49	43	37	36	36	34	35
DBT	M	2.53	2.59	2.63	2.78	2.83	2.78	2.75
	SD	0.80	0.65	0.67	0.63	0.61	0.66	0.71
	N	52	49	49	48	46	44	45
CTBE	M	2.59	2.68	2.74	2.80	2.88	2.70	2.67
	SD	0.68	0.78	0.64	0.59	0.65	0.65	0.61
	N	49	42	36	36	36	34	35
STAXI Trait	M	2.29	2.23	2.06	1.98	1.97	1.93	1.97

Measure	Stat	Pre treatment	4-Months	8-Months	12-Months	16-Months	20-Months	24-Months
	SD	0.75	0.55	0.62	0.59	0.52	0.56	0.54
	N	52	49	49	48	46	44	45
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CTBE	M	2.24	2.09	1.93	2.05	1.94	2.11	1.95
	SD	0.66	0.70	0.58	0.56	0.49	0.60	0.55
	N	49	43	37	37	36	34	35
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	M	2.19	2.20	2.00	1.90	1.91	1.72	1.87
	SD	0.68	0.64	0.55	0.48	0.54	0.42	0.56
	N	31	30	29	28	27	25	26
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DBT	M	2.43	2.12	1.97	2.11	2.13	2.02	1.87
	SD	0.64	0.50	0.74	0.63	0.62	0.55	0.66
	N	31	26	23	23	22	20	21
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PFQ Shame	M	2.33	2.20	2.21	1.87	1.97	1.75	1.91
	SD	1.00	0.95	0.72	0.81	0.84	0.74	0.73
	N	31	30	29	28	27	25	26
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PFQ Guilt	M	2.29	2.15	1.85	1.99	1.92	1.93	1.77
	SD	0.78	0.74	0.84	0.97	0.78	0.85	0.95
	N	31	26	23	23	22	20	21
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TMAS	M	0.73	0.69	0.66	0.61	0.58	0.54	0.55
	SD	0.15	0.19	0.18	0.23	0.24	0.25	0.24
	N	32	30	30	28	25	24	25
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DBT	M	0.82	0.72	0.64	0.74	0.66	0.69	0.67
	SD	0.09	0.15	0.22	0.15	0.21	0.19	0.19
	N	31	26	23	22	22	18	20
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CTBE	M	0.82	0.72	0.64	0.74	0.66	0.69	0.67
	SD	0.09	0.15	0.22	0.15	0.21	0.19	0.19
	N	31	26	23	22	22	18	20

Note. AAQ= Acceptance and Action Questionnaire, STAXI= State Trait Anger Inventory, PFQ= Personal Feelings Questionnaire, TMAS= Tailor Manifest Anxiety Inventory, DBT = Dialectical Behavior Therapy, CTBE = Community Treatment by Experts

Table 2

HLM Results for Each Outcome Measure

AAQ	DBT Cohort 1	-1.95	0.42	-	92.9	<	Unstructured, Autoregressive
	DBT Cohort 2	-3.61	0.42	-	67.1	<	
	CTBE Cohort 1	-0.86	0.45	-	90.7	.06	
	CTBE Cohort 2	-2.51	0.45	-	71.9	<	
	DBT vs. CTBE	-1.09	0.50	-	79.9	.03	
	Cohort 1 vs. 2	1.65	0.50	3.3	79.8	<	
STAXI Anger Control	DBT	0.04	0.01		86.1	<	Unstructured
	CTBE	0.02	0.01		92.1	.23	
	DBT vs. CTBE	0.02	0.02		89.4	.21	
STAXI Anger In	DBT	-0.09	0.01	-	79.5	<	Unstructured, Autoregressive
	CTBE	-0.06	0.01	-	83.0	<	
	DBT vs. CTBE	-0.03	0.02	-	81.5	.15	
STAXI Anger Out	DBT	-0.05	0.01	-	88.1	<.001	Unstructured
	CTBE	-0.01	0.01	-	96.6	.37	
	DBT vs. CTBE	-0.04	0.02	-	92.8	.03	
STAXI Anger Trait	DBT Drops	-0.09	0.02	-	98.6	<.001	Unstructured, Autoregressive
	DBT Completers	-0.05	0.01	-	81.2	<.001	
	CTBE Drops	-0.08	0.02	-	106.	<.001	
	CTBE Completers	-0.03	0.01	-	80.4	.02	
	DBT vs. CTBE	-0.02	0.02	-	83.7	.40	
	Completers vs. Drops	0.05	0.02	2.1	99.7	.03	
PFQ Shame	DBT	-0.07	0.02	-	54.2	<.005	Unstructured, Autoregressive
	CTBE	-0.08	0.02	-	56.6	<	
	DBT vs. CTBE	0.01	0.03		55.6	.64	
PFQ Guilt	DBT	-0.07	0.03	-	51.2	<.01	Unstructured, Autoregressive
	CTBE	-0.07	0.03	-	52.6	.01	

	DBT vs. CTBE	-0.001	0.04	-	52.0	.98
TMAS						
	DBT	-0.03	0.01	-	47.8	<
	CTBE	-0.02	0.01	-	47.7	.01
	DBT vs. CTBE	-0.01	0.01	-	47.8	.60

Note.

¹ Each slope is compared to a null slope using a *t*-test, and the *t* value, degrees of freedom and significance are presented in this table.

² A random intercept and random slope HLM model with an unstructured covariance structure for the random effects provided the best fit for the data for all outcomes. To test whether a model accounting for within subject correlation between time-points better explains the data, we fit an autoregressive (AR1) correlated residual error structure to each model (Gibbons et al., 1993). This more complex model was selected only if the model fit was significantly improved.

S.E.=standard error; AAQ= Acceptance and Action Questionnaire, STAXI= State Trait Anger Inventory, PFQ= Personal Feelings Questionnaire, TMAS= Tailor Manifest Anxiety Inventory, DBT=Dialectical Behavioral Therapy, CTBE=Community Treatment by Experts, Drops = participants who dropped out of treatment, Completers = participants who completed treatment.