# Outcome and predictors of functional impairment in suicidal women with BPD receiving Dialectical Behavior Therapy

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## Abstract

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Individuals diagnosed with BPD are more likely to be more functionally impaired, or experience difficulty finding and maintaining satisfying employment, housing, or relationships. The theory underlying Dialectical Behavior Therapy (DBT) proposes that emotion dysregulation is the core feature of Borderline Personality Disorder (BPD) and lacking skills to regulate emotions drives many of the maladaptive behaviors associated with BPD. While various aspects of functioning have been examined in individuals diagnosed with BPD, possible mechanisms have not been explored. Participants (n=99) were drawn from a single-blind, randomized controlled trial component analysis of DBT. Participants were women diagnosed of borderline personality disorder who had at least two episodes of suicide attempts and/or non-suicidal self-injury (NSSI) in the last 5 years, an episode in the 8 weeks prior to screening, and a suicide attempt in the past year. Results indicate that DBT improve functioning. Emotion dysregulation and skills use assessed from the previous period predicted functional outcomes. Implications of the findings are discussed.

## Introduction

Borderline personality disorder (BPD) is a serious mental disorder characterized by a pervasive pattern of instability of self-image, affect, and interpersonal relationships, (American Psychiatric Association, 2013; DSM-5). As a result, individuals diagnosed of BPD are more likely to be more functionally impaired, or experience difficulty finding and maintaining satisfying employment, housing, or relationships. Indeed, it is the presence of this severe psychosocial impairment that is characteristic of BPD (e.g. Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004). For example, over 50% of individuals with BPD have difficulty obtaining and maintaining employment (Cournos & Goldfinger, 2010), which is likely to lead to or exacerbate impairment in other clinical domains (Tomko, Trull, Wood, & Sher, 2013). Coid et al. (2009) found that individuals with BPD were 7.4 times more likely to be homeless than treatment seeking individuals without BPD. Additionally, individuals with BPD are often dependent on social services (Sansone & Sansone, 2012; Tomko, Trull, Wood, & Sher, 2013). Despite prevalence rates of BPD of 2.5% in non-clinical samples (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012) in the U.S. individuals with BPD make up 25% of those receiving Social Security Insurance and 35% of those on Social Security Disability Insurance (New Freedom Commission, 2003).

This has led to a consumer-driven movement that carries clients with BPD beyond symptomatic remission to the next phase of recovery – a fulfilling life, with satisfying relationships, meaningful goals, and gratifying employment (Farrell et al. 2009). Unfortunately, even after treatment, features of functioning remained impaired despite remission in other borderline characteristics. For example, Skodol and colleagues (2002) found that despite receiving extensive psychotherapy and/or pharmacotherapy, 52% of individuals with BPD

remain habitually unemployed, only 55% are globally satisfied, and only 47% have adequate overall functioning. In a trial of Schema-Focused Psychotherapy, while participants enrolled in the experimental condition were more likely to be employed at follow-up, there was no improvement in quality-of-life scores in either condition (Nadort et al., 2009). In a five-year follow-up study of Mentalization Based Treatment, participants in the treatment condition showed reductions in diagnostic status, suicidal behaviors, and unemployment, however general social functioning remained impaired in both conditions (Bateman & Fonagy, 2008). Interpersonal functioning has also been noted as being stable despite remission in other BPD characteristics and behaviors (see Stepp et al., 2011). Taken together, this has led some theorists and researchers to suggest that individuals diagnosed with BPD are likely to be perpetually impaired (Skodol et al., 2005).

With added emphasis on broader improvements beyond symptom remission, treatments for BPD should target appropriate mechanisms that lead to improvements in broader domains such as functioning. Difficulty in regulating emotions has been proposed as a transdiagnostic causal and maintenance mechanism across a large number of mental disorders (Kring & Sloan, 2009). Linehan's (1993a) biosocial theory of BPD conceptualizes BPD as a disorder of pervasive emotion dysregulation. Emotion dysregulation is the inability to change or regulate emotional cues, experiences, actions, verbal responses and/or non-verbal expressions under normative conditions. Pervasive emotion dysregulation results from an increased vulnerability to high emotionality combined with an inability to regulate intense emotional responses (Linehan, Bohus, & Lynch, 2007). Much of the dysfunctional behavior or impulsive behavior found within individuals with BPD (e.g. suicide attempts, non-suicidal self-injury (NSSI), substance use) has been conceptualized as attempts to regulate emotions and/or arises in response to emotional

states (Brown, Comtois, & Linehan, 2002; Linehan, 1993; Trull et al., 2000). Along these lines, impulsive behaviors offer immediate distraction or relief from emotional distress (Lawrence, Allen, & Chanen, 2010).

Dialectical Behavior Therapy (DBT; Linehan, 1993) is a cognitive behavioral treatment initially designed to treat highly suicidal, complex and difficult to treat individuals with a focus on emotion dysregulation. A recent Cochrane review of psychological therapies for BPD concluded that DBT is the most robust of the therapies examined and is effective at reducing self-harm (including suicide attempts), anger, and improvements in general functioning and has the most research (Stoffers et al., 2012) supporting its efficacy in treating borderline personality disorder (BPD).

DBT treatment also includes weekly behavioral skills training, which delivers skills that have the ability to regulate emotions, tolerate distress, and interact effectively with others while simultaneously increasing behavioral control. A growing body of research on individuals with BPD supports the DBT skills deficit model, which suggests that lacking skills leads to and/or maintains dysfunctional behavior. This model has been supported in research that has identified DBT skills use as a mediator for suicidal behavior, expression of anger, and interpersonal problems (Neacsiu, Rizvi, & Linehan, 2010). Further, DBT skills use alone (without individual therapy) has been found to be effective for numerous populations including treatment resistant depression (Harley, Sprich, Safren, Jacobo, & Fava, 2008), ADHD (Hirvikoski et al., 2011), women with binge eating disorder (Telch, Agras, & Linehan, 2001), and adolescents with oppositional defiant disorder (Nelson-Gray et al., 2006). An important question that still needs to be addressed more fully is whether a treatment that focuses on emotion regulation and behavioral skills acquisition leads to improvement in other broader domains such as functioning.

Data from Linehan's first RCT on BPD showed participants receiving DBT had significant improvements in various aspects of functioning (e.g. social global adjustment, global assessment scale) over treatment as usual (Linehan, Tutek, Heard, & Armstrong, 1994). In a trial of DBT for substance dependent women with BPD, there was a significant improvement in social and global adjustment over a community treatment as usual that was observed at follow-up (Linehan, Schmidt, Dimeff, Craft, Kanter, & Comtois, 1999). DBT showed improvements for individuals diagnosed with BPD in interpersonal and global functioning over a waitlist who saw treatment in the community (Bohus et al., 2004). Taken together, DBT has the capability to improve general aspects of functioning.

Both lacking skills to overcome interpersonal and functional difficulties and being unable to regulate subsequent emotions might account for much of the functional impairment in those with BPD. Although various aspects of functioning have been evaluated during the course of treatment, mechanisms of functioning have yet to be explored; thus, this paper has three hypotheses and one exploratory hypothesis: (1) functional outcomes will improve during the course of a treatment outcome study of Dialectical Behavior Therapy for women who meet criteria for BPD and are suicidal, (2) emotion dysregulation will predict functional impairment, (3) skills use will predict functional impairment, and (4) we will examine the possible bi-directionality of both emotion dysregulation and skills use on functional impairment.

## Method

### Study Design

A single-blind randomized controlled trial (RCT) compared Standard DBT (S-DBT), DBT Skills training (DBT-S) and DBT Individual therapy (DBT-I). A computerized adaptive randomization procedure (White & Freedman 1979) matched participants on five variables: age,

number of suicide attempts, number of NSSI episodes, psychiatric hospitalizations in the last year, and depression scores. Assessments were conducted at pre-treatment and quarterly during one year of treatment and one year of follow-up. All assessments were conducted by blinded independent clinical assessors trained by instrument developers or approved trainers and evaluated as reliable for each instrument. The participant coordinator, not blind to condition, executed randomization and collected data related to treatment. All study procedures were conducted in accord with IRB approved procedures and were carried out at the University of Washington Behavioral Research and Therapy Clinics and community settings in Seattle, WA. The flow of participants through the study is shown in Figure 1.

**Participants**

Participants were 99 women between the ages of 18 and 60 who met criteria for BPD on the Structured Clinical Interview for DSM-IV, Axis II (SCID-II; First, Spitzer, Gibbon, & Williams, 1996) and had at least two episodes of intentional self-injury (suicide attempts and/or NSSI) in the last 5 years, at least one episode in the 8-week period before entering the study and at least one suicide attempt in the past year. Individuals were excluded if they had an IQ of less than 70 on the Peabody Picture Vocabulary Test - Revised (PPVT-R; Dunn & Dunn, 1981), met criteria for current psychotic or bipolar disorders on the Structured Clinical Interview for DSM-IV, Axis I (SCID-I; First, Spitzer, Gibbon, & Williams, 1995), had a seizure disorder requiring medication or required primary treatment for another debilitating condition. Recruitment was via outreach to healthcare providers. All participants provided written informed consent after the study procedures were explained.

**Baseline Measures**

**Demographic.** A demographic questionnaire assessed participants' self-reported age, racial/ethnic background, education, marital status, and income.

**Structured Clinical Interview for DSM-IV Axis II Personality Disorders-BPD Module.** (SCID-II-BPD; First et al., 1997). The SCID-II-BPD is a semi-structured interview used to diagnose BPD. The language of SCID-II criterion items closely follows that of DSM-IV criteria, and assessors rate each item as 1 (*absent*), 2 (*subthreshold*), or 3 (*threshold*). The present study included only the BPD module, which was administered as part of the in-person screening, to assess for borderline personality disorder.

Participants were assessed the following at baseline, 4-, 8-, 12-, 16-, 20-, and 24-months.

**Outcome Measures**

**The Social History Interview.** (SHI; Keller et al., 1987; Weissman & Bothwell, 1976) is an adaptation of both the psychosocial functioning portion of the Social Adjustment Scale (Weissman & Bothwell, 1976) and the Longitudinal Interview Follow-Up Evaluation base schedule (Keller et al., 1987), allowed for the determine of Global Social Adjustment (GSA; ratings are on a 1-5 scale) and Global Assessment Scale (GAS; ratings are on a 0-100 scale). At each assessment, interviewers made GSA ratings for the best and worst weeks of the last month of the assessment period and for the best week overall. Higher scores on the GAS and lower scores on the GSA indicate better functioning.

**Difficulties in Emotion Regulation Scale**. (DERS; Gratz & Roemer, 2004). The DERS is a 39-item self-report measure of individuals' characteristic levels of emotion dysregulation across six domains: nonacceptance of negative emotions, inability to engage in goal-directed behaviors when experiencing negative emotions, difficulties in controlling impulsive behaviors when experiencing negative emotions, limited access to emotion regulation strategies perceived as

effective, lack of emotional awareness, and lack of emotional clarity. Participants answer on a 5-point Likert-type scale ranging from 1 (almost never) to 5 (almost always). The DERS has high internal consistency (Cronbach's α = .93), good test-retest reliability ($\rho I$ =.88, p < .01), and adequate construct and predictive validity.

**DBT Ways of Coping Checklist (DBT-WCCL).** The DBT-WCCL is adapted from the Revised Ways of Coping Checklist (RWCCL; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985) and includes additional items intended to represent DBT skills (Neacsiu, Rizvi, Vitaliano, Lynch, & Linehan, 2010). The DBT-WCCL is a self-report questionnaire including 38 items that measures the frequency of DBT skills use over the previous month. All items are rated from 0 to 3 ("never use" to "always use"). The DBT skills use index was computed by averaging across all items in the scale. Previous examination of the psychometric properties of the DBT-WCCL in BPD individuals revealed that the DBT Skills Subscale of the DBT-WCCL (DSS) has high internal consistency (Cronbach α=0.92 to 0.96). Test-retest reliability at 4 months for 119 BPD individuals treated without access to skills training was acceptable, ($\rho_I$ = 0.71, p <0.001).

## Treatment

The RCT from which this data was collected was a component analysis of the treatment modes in DBT. Subjects were randomly assigned to one of three treatment conditions: standard DBT **(**Linehan, 1993ab; which involves four components: weekly individual therapy sessions, weekly group skills training sessions, as needed between session phone coaching and weekly therapist team consultation meetings), individual DBT only (which was similar to standard DBT except group skills training component was withdrawn and teaching and coaching in DBT skills could not be provided in individual therapy sessions), or group DBT skills training only (which

was comparable to standard DBT except that the DBT individual therapy component was withdrawn). All subjects underwent one year of treatment.

## Analytic Strategy

Hierarchical linear modeling (e.g. HLM; Bryk & Raudenbush, 1992) also known as mixed effects or multilevel modeling (Pinheiro & Bates, 2000), was the primary data analytic tool on the sample. Compared to other methods, HLM is more flexible as it treats time as a continuous factor, allowing for variability in the actual time of assessment for each participant. HLM can model incomplete data across time, which increases power due to inclusion of more data points. Finally, HLM allows for time-lagged prediction as a method of exploring cross-time association and change from previous time points. Assumptions of HLM are homoscedasticity, normality, and independence of the error terms. All assumptions were met unless otherwise noted.

In order to test the first hypothesis, growth curve analysis was used to estimate baseline and change in observed outcomes for each participant during one year of treatment and one year of follow-up. We tested separate unconditional growth curve models of both functioning variables in the worst weeks, emotion dysregulation, and skills use to test for mean change and variability in change. Growth curve models estimate individual slopes and intercepts for all participants in the sample, and also estimate sample-average slopes and intercepts, as well as between-individual variation around the sample-average slopes and intercepts.

To examine whether changes in emotion dysregulation and skills use predicted change in functional outcomes, we included time lagged predictors (TLPs) to explore the causal relationships of emotion dysregulation and skills use to the outcome variables. Thus, we analyzed two sets of models: (a) functioning variables as the outcome with emotion dysregulation and skills use as a TLP and (b) emotion dysregulation and skills use as outcomes

and functioning variables as TLPs. Following recommendations of Singer and Willett (2003), TLPs were added as an additional fixed effect at level 1 of the model.

Appropriate covariance structures were analytically determined based on a mixture of chi-squares in comparing nested models and model fit criteria (Verbeke, 1997). All analyses were conducted using SPSS 19.0 (IBM Corp.).

## Results

**Preliminary Analyses.** Participant characteristics are outlined in table 1. Descriptives of functioning, difficulties in emotion regulation, and interpersonal effectiveness over treatment year and follow-up can be seen in table 2. In order to determine whether treatment condition had differential effects on functioning, emotion dysregulation, and skills use, or whether we could combine them into one group, HLM analyses were conducted assessing the interaction between time and each condition in predicting the dependent variables. For GAS, the analysis revealed a non-significant effect for condition ($F(1, 45.85)=0.02$, $p=0.89$) and a non-significant interaction between condition and time ($F(1, 56.62)=0.28$, $p=0.60$). For GSA, there was a non-significant effect for condition ($F(1, 78.66)=0.11$, $p=0.74$) and a non-significant interaction between condition and time ($F(1, 68.71)=0.00$, $p=0.99$). For DERS, there was also a non-significant effect for condition, ($F(1, 88.71)=0.78$, $p=0.38$) and a non-significant interaction between condition and time ($F(1, 66.82)=0.40$, $p=0.53$). Finally, skills use revealed a similar pattern; a non-significant effect for condition ($F(1, 89.14)=0.14$, $p=0.71$) and a non-significant interaction between condition and time ($F(1, 69.97)=0.14$, $p=0.71$). Each condition had similar effects on variations of each variable of interest over time and therefore was combined into one group for the rest of the analyses.

**Hypothesis 1: Functioning will improve over time.** To test the first hypothesis, we developed separate unconditional growth curve models for all variables from baseline to 24 month follow-up. The time variable was centered at the mid- point of the study to reduce collinearity between the linear and quadratic components.

Based on the observed sample means that show an initial improvement in functioning which levels off as time progressed, we fitted a growth model with intercept, slope, and quadratic, effects capturing variation at baseline, the linear change over time, the subsequent improvement of functioning, and the flattening of the overall trend, respectively. For GAS, likelihood ratio testing indicated that quadratic effect of time provided a significant improvement in model fit over including time as a cubic effect. The results of the model indicate that all growth effects had significant means and variances (Table 3). Specifically, the intercept and linear effect were positive, while the quadratic slope effects were negative. There was also significant variability in each of the growth parameters, indicating that there were significant inter-individual differences in terms of how participants' functioning changed from baseline through 2-year follow-up. Due to likelihood ratio testing of model fit, the linear slope was allowed to vary across individuals, but the quadratic slope was not allowed to vary. At the 12-month assessment (end of treatment year), the mean functioning in the sample was 50.38. There was a significant linear increase in functioning over the seven assessment periods, $\beta = 1.96$, $t(58.01) = 9.08$, $p < .001$, suggesting an increase in functioning of nearly 1.96 points every four months. The quadratic effect was also significant, $\beta = -.49$, $t(402.00) = -5.78$, $p < .001$, suggesting a decelerated increase in functioning over time.

Similar to GAS, likelihood ratio testing determined that the quadratic effect of time showed a significant improvement in model fit over including time as a cubic effect. As can be

seen in table 2, at the 12 month assessment point, mean GSA in the sample was 3.77. There was a significant linear decrease in GSA over the seven assessment periods, $\beta = -0.12$, $t(70.21) = -6.97$, $p < .001$. The quadratic effect was also significant $\beta = 0.03$, $t(395.99) = 4.41$, $p < .001$, suggesting an acceleration of the effect over time. See table 2 for growth models of DERS and skills use.

**Hypothesis 2 & 3: DERS and Skills use will predict functioning.** Four models were developed to test whether changes in emotion regulation and skills use from the previous assessment period predicted changes in individual trajectories in functioning variables (GAS and GSA). A model was developed to test whether DERS from the previous assessment period predicted changes in individual trajectories in GAS. Results indicated that improvement in emotion regulation predicted better functioning, $\beta = -.06$, $t(352.36) = -5.78$, $p < .001$. For every one-point increase in functioning, difficulties in emotion regulation decreased .06 points over and above the increase accounted for by time and deceleration in the increase in functioning. Further, as can be seen in table 4, adding DERS from the previous assessment period provided a significant effect of GSA ($\beta = 0.00$, $t(374.63) = 2.96$, $p = .003$).

A model was developed to test whether skills use from the previous assessment period predicted GAS. After controlling for the linear, quadratic, and cubic effects of time, skills use did predict GAS, $\beta = 2.16$, $t(364.71) = 1.99$, $p < .05$. As can be seen in table 4, adding skills use from the previous assessment period provided a significant effect of GSA, $\beta = -.23$ $t(349.23) = -2.96$, $p < .001$.

**Exploratory hypothesis 4: Functional variables predicting DERS and skills use.** To examine the possibility of bi-directionality, four models were developed with emotion dysregulation and skills use as TLPs. Controlling for linear and quadratic time, GAS from the previous period did

predict individual trajectories in emotion dysregulation β = -.42 *t*(352.83) =-3.29 *p*<.001. In this model, both the linear and quadratic elements of time were also significant. This differed from the previous model where entering DERS from the previous assessment period degraded the impact of the linear and quadratic elements of time (see table 4). Similar to GAS, entering GSA from the previous assessment period also significantly predicted DERS, β = 6.52 *t*(330.13) =3.86 *p*<.001. Further, entering GSA from the previous period did not significantly degrade the impact of the linear or quadratic components.

For skills use, GAS from the previous period did not predict individual trajectories in skills use, β = .01 *t*(307.12) = .62, *p* = .53. Finally, adding GSA from the previous period did not significantly predict individual trajectories in skills use, β = -.03 *t*(304.41) = -.84, *p* = .40.

## Discussion

The current study examined three hypotheses and one exploratory hypothesis in a sample of suicidal women who met criteria for BPD: 1) functional impairment would improve over time 2) emotion dysregulation would predict functional impairment, 3) skills use would predict functional impairment, and 4) to examine the bi-directional effects of both emotion dysregulation and skills use on functioning. Three major findings emerged from the analyses. Results from the analyses showed that both global social adjustment and global assessment scale improved over time. Emotion dysregulation had a bi-directional effect on functioning, meaning that emotion dysregulation prospectively predicted functioning and functioning prospectively predicted emotion dysregulation. Skills use had a uni-directional effect, meaning that while skills use prospectively predicted functioning variables, GAS or GSA did not prospectively predict skills use.

First, our results provide additional support that DBT is an efficacious treatment for functional impairment (Bohus et al., 2004; Linehan, Schmidt, Dimeff, Craft, Kanter, & Comtois, 1999; Linehan, Tutek, Heard, & Armstrong, 1994). Specifically both GAS and GSA improved over time. It should be noted that this study examined GAS and GSA both at the worst week from the most recent month, as opposed to the best week. GAS is a measure of overall functional impairment, which broadly refers to how adaptively one is meeting various problems-in-living. Mean GAS scores improved from 38.91 to 52.79 from pre-treatment to follow-up, or from "major impairment" to "moderate difficulty" in functioning. However, ratings of GAS are influenced by the presence of a suicide attempt and are thus a relatively well functioning individual could receive a low GAS score due to a suicide attempt. As this population was recruited primarily for the presence of high suicidality, interpretations of GAS should be examined with caution. GSA is a pure measure of impairment that specifically refers to the clients' impairment in work, school, housing, and relationships. The GSA score ranged from 4.38 to 3.58 from pre-treatment to 24 month follow-up, or "moderate impairment" to "slight impairment." In both GAS and GSA the relationships were quadratic, indicating an accelerated level of improvement that leveled off once treatment ended (e.g. 12 month assessment). This indicates that time in treatment has the most powerful effect in seeing functional improvement which were maintained for one year post-treatment. However, because there was no control condition in these analyses, these results must be interpreted with caution (e.g. regression to the mean; Davis, 1976).

There appears to be some symbiotic treatment gains that result from targeting emotion dysregulation and functional impairment in treatment. More specifically, emotion dysregulation appears to both influence and be influenced by functional impairment. While these results

support the hypothesis that targeting emotion regulation strategies should be a treatment target (Lieb et al., 2004), there is evidence that improvements in functioning lead to improved emotion regulation capabilities. In this way, perhaps having a stable job, relationship, and housing could also lead to reduced emotion dysregulation. DBT's treatment targets and stages could explain this bi-directional relationship. DBT includes a set of target priorities based on current imminent life threatening risk, severity, pervasiveness, and complexity of disorder and disability. In stage 1, the focus of treatment is to stabilize the client and achieve behavioral control. Stage 1 is broken into the following behavioral targets: (1) to decrease imminent life interfering behaviors (e.g. suicide attempts, non-suicidal self-injury), (2) reduce therapy interfering behaviors (e.g. missing treatment, behaviors that are burning out the therapist), (3) decreasing quality of life interfering behaviors (e.g. substance use, unemployment, homelessness) and increasing skillful behaviors to replace dysfunctional behaviors (DBT skills training). While DBT directly is primarily a treatment for emotion dysregulation, the therapist will directly target functional impairment (via quality of life interfering behaviors) once life threatening behaviors and therapy interfering behaviors has been ameliorated (Linehan, 1993a).

Finally, DBT skills use prospectively predicted functioning, but improvements in functioning did not lead to increased skills use. Acquiring skills to regulation emotions, tolerate distress, and interact effectively with others has the ability to improve quality of life as it relates to relationships, employment, and housing. DBT is based on the assumption that remediating skills deficits will decrease maladaptive behavior. This study provides further support of the skills deficit model as it relates to DBT skills (Lindenboim et al., 2008; Neaucsui, Rizvi, & Linehan, 2010; Stepp et al., 2008); however, applying it beyond maladaptive behavior but toward more adaptive, pro-social behavior (e.g. functioning).

## Limitations and Future Directions

While this is the first study to examine predictors of functional impairment in suicidal individuals with BPD, there are many limitations that require consideration. For one, these data were drawn from a RCT aimed to analyze the different components of DBT and all treatment conditions were collapsed into one. This means that some participants did not receive the complete DBT model. We would expect to see between condition differences in our predictor and outcome variables; however, were underpowered to see any treatment effects. Further, numerous other factors could be associated with treatment improvement (e.g. regression to the mean, maturation). While this study used well validated measures of functioning, emotion dysregulation, and skills use, the latter measures were derived from the clients' perspective. In addition, the present study utilized quarterly, self-reported, ratings assessment of emotion dysregulation and skills use. A possible remedy would be to incorporate psychophysiological assessment of emotion dysregulation and/or daily dairy tracking of skills use.

A considerable strength of this project was that this study included numerous time points nested within a larger RCT. However, our statistical tests limited our ability to make causal associations and instead are suggestive of possible causal pathways linking the emotion regulation, skills use, and functioning. The number of analyses that examined the order of change in emotion regulation, skills use, and functioning did not correct for a possible increase in Type I error. These concerns, however, are partly mitigated by the consistent findings concerning functional change and the association between emotion dysregulation and skills use in expected directions. Nonetheless, replication of these findings is needed.

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Table 1. Baseline Demographic Characteristics.

| Variable | Total (*N*=99) |
|---|---|
| **Demographic Characteristics** | |
| **Age, years, M ± SD** | 30.3 ± 8.9 |
| **Race** | |
| White | 71.1 |
| Asian American | 5.2 |
| Biracial | 21.6 |
| Other | 2.1 |
| **Single, Divorced or Separated** | 84.8 |
| **Education** | |
| Less than high school | 7.1 |
| High school graduate or GED | 9.1 |
| Some college or technical school | 57.6 |
| College graduate | 26.3 |
| **Annual Income ($)** | |
| Below 15,000 | 60.2 |
| 15,000 – 29,999 | 28.6 |
| 30,000 and up | 11.2 |
| **Current psychotropic medications** | 3.1 ± 2.7 |

Table 2. Descriptives of GAS, GSA, DERS, and Skills Use over treatment year and follow-up.

| Variable | Baseline | 4-month | 8-month | 12-month | 16-month | 20-month | 24-month |
|---|---|---|---|---|---|---|---|
| | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* |
| GAS Worst Week | 38.91 (4.89) | 46.77 (7.13) | 48.64 (9.83) | 49.69 (11.23) | 51.39 (9.46) | 53.41 (10.27) | 52.79 (12.33) |
| GSA Worst Week | 4.38 (.51) | 4.05 (.54) | 3.86 (.63) | 3.72 (.68) | 3.75 (.78) | 3.59 (.83) | 3.58 (.80) |
| DERS | 127.04 (21.14) | 106.57 (25.87) | 101.36 (26.93) | 88.86 (25.66) | 90.77 (29.42) | 88.27 (27.36) | 87.25 (27.87) |
| Skills Use | 1.45 (.51) | 1.91 (.50) | 1.99 (.55) | 2.09 (.44) | 2.03 (.52) | 2.04 (.53) | 2.04 (.49) |

Table 3. Unconditional growth models of GAS, GSA, Satisfaction, DERS, and Skills Use

| Factor | B | SE | *t* | 95% CI | p-value |
|---|---|---|---|---|---|
| **GAS Worst Week** | | | | | |
| Intercept | 50.38 | .89 | 56.91 | 48.62-52.14 | <.001 |
| Linear | 1.97 | .22 | 9.08 | 1.53-2.40 | <.001 |
| Quadratic | -.49 | .09 | -5.77 | -.66--.32 | <.001 |
| **GSA Worst Week** | | | | | |
| Intercept | 3.77 | .06 | 60.00 | 3.64-3.89 | <.001 |
| Linear | -.11 | .02 | -6.97 | -.15-.08< | <.001 |
| Quadratic | .03 | .01 | 4.41 | .01-.04 | <.001 |
| **DERS** | | | | | |
| Intercept | 92.16 | 2.51 | 36.74 | 87.19-97.12 | <.001 |
| Linear | -5.99 | .54 | -11.11 | -7.06--4.91 | <.001 |
| Quadratic | 1.66 | .22 | 7.74 | 1.24-2.09 | <.001 |
| **Skills Use** | | | | | |
| Intercept | 2.04 | .05 | 42.32 | 1.95-2.14 | <.001 |
| Linear | -.02 | .02 | -1.02 | -.06-.02 | .31 |
| Quadratic | -.03 | .00 | -8.07 | -.04--.02 | <.001 |
| Cubic | .01 | .00 | 4.92 | .01-.2 | <.001 |

Table 4. Prediction of DERS and Skills use on functioning variables.

| Variable | Coefficient | 95% CI | p-value |
|---|---|---|---|
| **GAS Worst Week** | | | |
| Intercept | 56.53 | 52.08-60.97 | <.001 |
| Linear | .82 | .13-1.52 | .02 |
| Quadratic | -.01 | -.31-.29 | .94 |
| DERS from Previous Period | -.06 | -.11--.02 | .002 |
| **GSA Worst Week** | | | |
| Intercept | 3.36 | 3.07-3.65 | <.001 |
| Linear | -.06 | -.11--.02 | .007 |
| Quadratic | .01 | -.01-.03 | .43 |
| DERS from Previous Period | .00 | .00-.01 | .003 |
| **GAS Worst Week** | | | |
| Intercept | 45.85 | 41.12-50.58 | <.001 |
| Linear | 1.12 | .47-1.77 | .001 |
| Quadratic | -.06 | -.36-.24 | .68 |
| Skills from Previous Period | 2.16 | .02-4.31 | <.05 |
| **GSA Worst Week** | | | |
| Intercept | 4.23 | 3.92-4.53 | <.001 |
| Linear | -.07 | -.11--.03 | .001 |
| Quadratic | .01 | -.01-.03 | .55 |
| Skills from Previous Period | -.23 | -.36--.10 | .001 |

Table 5. Prediction of functioning variables on DERS and Skills Use.

| **Variable** | Coefficient | 95% CI | p-value |
|---|---|---|---|
| **DERS** | | | |
| Intercept | 115.29 | 101.78-128.80 | <.001 |
| Linear | -3.28 | -.482--.1.75 | <.001 |
| Quadratic | .64 | .02-1.26 | .04 |
| GAS from Previous Period | -.42 | -.68--.17 | .001 |
| **DERS** | | | |
| Intercept | 69.52 | 55.79-83.25 | <.001 |
| Linear | -3.46 | -4.92--2.01 | <.001 |
| Quadratic | .69 | .09-1.28 | <.05 |
| GSA from Previous Period | 5.52 | 3.0-9.83 | <.001 |
| **Skills Use** | | | |
| Intercept | 1.96 | 1.69-2.23 | <.001 |
| Linear | -.02 | -.06-.03 | .41 |
| Quadratic | -.02 | -.04--.01 | .01 |
| Cubic | .01 | .00-.02 | <.05 |
| GAS from Previous Period | .01 | -.00-.01 | .53 |
| **Skills Use** | | | |
| Intercept | 2.14 | 1.88-2.40 | <.001 |
| Linear | -.02 | -.07-.03 | .40 |
| Quadratic | -.02 | -.04--.01 | .007 |
| Cubic | .01 | .00-.02 | <.05 |
| GSA from Previous Period | -.03 | -.09-.04 | .40 |