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A Positive Emotion Regulation Intervention for Bipolar I Disorder: Treatment Development and Initial Outcomes

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Abstract

Objective: Dysfunction in positive affect is a defining symptom of bipolar I disorder (BD), both during and between mood episodes. We hypothesize that helping people with BD learn skills to create balance in their affective experiences by engaging in strategies that increase low activation positive emotion (LAP; e.g., relaxation) could help to improve well-being during periods of symptom remission. We discuss the development and preliminary outcomes of a positive emotion regulation (PER) group treatment for people with BD, designed as a supplement to pharmacological treatment.

Method: The Learning Affective Understanding for a Rich Emotional Life (LAUREL) intervention is a group-based intervention covering 10 empirically supported skills designed to increase LAP. Sixteen people with BD enrolled in the LAUREL intervention and twelve completed baseline and post-intervention assessments.

Results: Participants who completed the study (n=12) attended the majority of groups (87.96%) and reported practicing skills, on average, 16 times a week. We were unable to detect significant differences in mania symptoms following engagement in this PER intervention. Finally, participants reported increases in several areas associated with well-being post-intervention, including mindfulness, reappraisal, and self-compassion.

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Conclusion: This study provides a theoretical framework and preliminary support for a PER intervention for BD.

Keywords

Bipolar Disorder; Emotion; Group Treatment; Positive Emotion; Well-being

1. Introduction

Bipolar I disorder (BD) is a serious mental illness defined by the experience of mania, a mood episode characterized by heightened feelings of euphoria and/or irritability [1]. Other cardinal features of the disorder include high energy, perceived lack of need for sleep, increased goal-directed behavior, and impulsivity. People with BD are also at heightened risk for experiencing depressive episodes. Beyond mood episodes, BD is linked to a range of poor outcomes, including high rates of suicide [2], homelessness [3], divorce [4], and significant comorbidity with other psychiatric disorders, including anxiety [5] and substance use [6].

While mania is often characterized by heightened positive affect¹, many people with BD also exhibit high levels of positive affect during periods of symptom remission. In addition, extreme valuing of happiness has been found to be associated with and predict a more severe course of symptoms within BD [7]. People with BD also report difficulty controlling their impulsiveness during states of intense positive affect [8]. This affect-related impulsivity, in turn, relates to poorer quality of life, lack of well-being, suicidality, and aggression for those with BD [8–11]. Further, the experience of extreme positive emotions may be a warning sign or trigger for mania [12]. Conversely, evidence shows that positive affect is associated with better functioning in BD [13]. Together, these findings suggest that although certain aspects of positive affect may be disrupted in BD, positive emotions confer benefits for functioning just as they do for those without BD [14,15].

Due to the potentially triggering nature of positive affect, people with BD may attempt to “dampen,” or reduce, the experience of positive emotions [16]. Indeed, evidence suggests that those with BD report actively avoiding rewarding activities and dampening the experience of positive emotions more frequently than those without BD [17]. Although this may be intended as a strategy to protect oneself against full symptoms of mania, dampening positive emotions is associated with substantial consequences, including decreases in subjective well-being [17], increased depression symptoms [18], and attenuated attention to positive stimuli [19]. Paradoxically, dampening is also associated with increased symptoms of mania [18]. Thus, people with BD appear to be in a “Goldilocks” situation with positive emotions: too much or too little has negative consequences.

¹“Mood,” “affect,” and “emotion” are terms often used interchangeably, but refer to distinct feeling states. Throughout the paper, “mood” refers to a sustained feeling state that persists across contexts and may be accompanied by clinically significant symptoms (i.e., manic or depressive mood episode). “Affect” refers to a potentially momentary feeling state that reflects either valence (pleasantness or unpleasantness) or activation (high or low), or when referring to a variety of emotion labels that all represent or have been combined to reflect similar valence or activation. “Emotion” refers to specific emotion labels that reflect momentary feeling states (e.g., anger, sadness, boredom) and to processes meant to influence these states (e.g., emotion regulation).

Psychosocial interventions that focus on positive emotion regulation (PER), or the ability to modulate the onset, nature, and course of positive emotions [20], may help people with BD experience positive affect during periods of symptom remission without the risk of future mood episodes. Indeed, Celano and colleagues [21] found improvements in positive affect and optimism in a preliminary study of a 4-week telephone-based intervention incorporating skills to increase positive affect (e.g., gratitude, personal strengths, acts of kindness, and imagining a best possible self) among people recently discharged from psychiatric inpatient care for bipolar depression. Further, Kraiss and colleagues [22] developed and are in the process of evaluating a randomized control trial of a group intervention for people with BD in symptom remission, incorporating similar PER practices (e.g., personal goals, positive emotions, coping with fear of relapse, personal strengths, positive relationships, and compassion). Given that the application of PER interventions in BD is in its infancy relative to other clinical and non-clinical populations [23], additional implementation and outcomes studies are needed.

1.2 Theoretical Model for a PER Intervention for BD

The affective circumplex model posits that moods, emotions, and other feeling states are comprised of two core “affective” properties: valence (feelings ranging from pleasant/positive to unpleasant/negative) and activation (feelings ranging from quiet/still to active/energized) [24–26]. Thus, emotions vary on these two dimensions of affect and can be plotted on a circumplex, with valence serving as the x-axis and activation serving as the y-axis. For example, both excitement and relaxation are often interpreted as positively-valenced emotions, but they differ in activation. Awareness of both valence and activation can improve one’s emotional granularity (i.e., precision and specificity) [27], an aspect of emotional awareness that has been associated with more adaptive coping [28] and the use of more varied emotion regulation strategies [29].

Research suggests that people vary in how much they value positive affective states [30] and that there may be unique benefits to the experience of specific low activation positive emotions (LAP) [31]. For example, gratitude, conceptualized as a positive feeling state in response to another person’s kindness, is associated with increased prosocial behavior [32]. In addition, the feeling of compassion towards oneself and others is the foundation and focus of Loving Kindness Meditation, a type of mindfulness meditation that has been shown to reduce negative emotions, stress, and mood symptoms [33]. These findings suggest that emotions characterized as LAP are healthy and adaptive.

Specific to BD, research suggests that high activation positive emotions (HAP) may have costly outcomes. For those with high levels of emotion-related impulsivity, declines in cognitive control have been observed during HAP states [34]. Further, proclivity towards goal-pursuit (which is associated with HAP, such as pride and excitement) is well documented in BD [35]. People with BD show an elevated tendency to continue pursuing reward after initial success [36], high levels of persistence during difficult goal pursuit [35, 37] and elevated goal-setting [38]. While this may be adaptive at times, several studies suggest that manic episodes are more likely to occur after life events that involve goal-pursuit [39–41]. Thus, LAP may offer people with BD the opportunity to experience positive

emotion potentially without the risk for mania that HAP (and the dampening of such emotions) may confer.

Taken together, the experience of HAP (including emotions tied to extreme goal-pursuit) may be particularly pronounced for those with BD and contribute to a poorer course of the disorder. Alternatively, evidence in healthy people suggests that the experience and valuing of LAP show unique benefits. Improving LAP in conjunction with skills meant to increase the awareness and experience of emotions across the affective circumplex may be particularly beneficial for people with BD by helping to create emotional “balance” (i.e., experiencing emotions in moderation and across the affective circumplex). The purpose of the current study was twofold: (1) describe treatment development of the Learning Affective Understanding for a Rich Emotional Life (LAUREL) group intervention, and (2) demonstrate the implementation of the LAUREL intervention through a proof of concept open trial.

2. Method

2.1 LAUREL Treatment Development

The LAUREL intervention was conceptualized as an intervention to help improve emotion dysregulation in BD that continues to occur even during periods of symptom remission. It was modeled after a positive emotion intervention developed for people with schizophrenia [42] as well as other related interventions designed to increase positive emotions for people experiencing health-related stress [43–58]. In an effort to minimize the experience of intense positive emotions, we opted not to include certain skills that may overemphasize positive affect in this population (e.g., identifying personal strengths) and instead incorporated sessions on symptom monitoring and emotion education. Participants engaged in nine weekly 90-minute sessions during which they learned ten empirically supported skills [59]: (1) symptom tracking [60], (2) emotion tracking [61], (3) noting daily positives [62–64], (4) savoring positive events [65], (5) mindfulness [66], (6) positive reappraisal [67–69], (7) gratitude [70–71], (8) small acts of kindness [72–74], (9) self-compassion [75], and (10) setting and working toward attainable goals [76] (see Table 1).

Group sessions incorporated three main components consistent with cognitive behavioral therapy (CBT) principles: (1) didactic skill discussion; (2) skill training and practice; and (3) home practice. Therapists first provided a didactic discussion of a skill, including the rationale for incorporating the skill into one’s daily life, a summary of the empirical support highlighting the benefits of the skill, and real-world examples of how to use the skill at home. Participants then engaged in interactive skills practice, which focused on building skill mastery and generalization of the skill to contexts outside of the group. Participants were asked to practice the new skill, along with the previously learned skills, between sessions. They were provided with a review sheet that outlined the session content, forms for tracking their home practice and ratings of skill helpfulness, and materials to promote home practice. At the beginning of the next session, participants were encouraged to share their experiences with skill implementation, challenges they faced with home practice, and any noticeable benefits from engagement in LAUREL skills.

2.2. LAUREL Proof of Concept Open Trial

We recruited a small sample of individuals with bipolar I disorder to demonstrate the implementation of the LAUREL intervention and sought to explore the following questions: (1) Will people with BD engage in a skills-based PER group? (2) Will people with BD practice learned skills between group sessions? (3) Does skill training focused on increasing LAP increase symptoms of mania? (4) Do preliminary results suggest improvement in areas associated with well-being covered in the LAUREL intervention (e.g., savoring, mindfulness, reappraisal, self-compassion)?

2.2.1 Participants and procedures.—Sixteen people diagnosed with DSM-IV-TR² [77] bipolar I disorder between the ages of 18–60 completed informed consent procedures (see Table 2 for sample characteristics). Participants were recruited from the California Bay Area via Internet advertisements, community flyers, and nonprofit agencies for people with mental illness. Exclusion criteria included: a history of head trauma, stroke, neurological disease, or loss of consciousness for more than five minutes; more than two clinically significant symptoms of depression and/or mania in the past month; active suicidal ideation in the past month or more than two suicide attempts in the past 24 months; psychotic symptoms in the past month; meeting DSM-IV-TR criteria for substance abuse in the past month or dependence in the past six months; full scale IQ below 70, as assessed by the Wechsler Test of Adult Reading (WTAR) [78]; and inability to speak or understand English. Participants were also required to be currently under the care of a mental health professional and to provide consent for the research team to contact their provider(s) in the event of symptom exacerbation.

Trained clinical research staff determined preliminary eligibility of participants over the phone. Participants who were eligible after the initial phone screening were invited to an in-person enrollment session to complete informed consent procedures and to confirm study eligibility. Assessments of psychiatric symptoms and psychological well-being were conducted at baseline and post-intervention (within two weeks of the start/end of the intervention). Advanced clinical psychology graduate students with training in individual and group CBT techniques who did not conduct the baseline and post-intervention symptom assessments conducted LAUREL groups. Participants were compensated for their time during assessment interviews but not for the group sessions. Participants enrolled in one of three groups determined by timing of recruitment. Each group consisted of three to six participants.

2.2.2. Measures

2.2.2.1 Diagnostic assessment.: The Structured Clinical Interview for DSM-IV (SCID) [79] was used to assess diagnostic status. SCID interviewers were trained research staff or doctoral level graduate students who received extensive training in this instrument.

2.2.2.2 Mood symptoms.: The Young Mania Rating Scale (YMRS) [80] is an 11-item clinician-rated measure of mania symptoms with total scores ranging from 0 to 60 and a

²DSM-IV-TR and DSM-5 criteria for Bipolar I Disorder are comparable.

clinical cutoff score of 20 (Cronbach's $\alpha=0.73$). The Modified Hamilton Rating Scale for Depression (mHRSD) [81] is a 17-item interview to assess symptoms of current depression with total scores ranging from 0 to 52 (0–7=no depression, 8–16=mild depression, 17–23=moderate depression, >24=severe depression [82]; $\alpha=0.61$). This modified version correlates highly with the original HRSD ($r=0.84$).

2.2.2.3 Engagement and helpfulness of LAUREL Skills.: Attendance was collected during each group. Further, each week participants were asked to complete a home practice log of the number of times they practiced each of the LAUREL skills and how helpful they found each skill on a scale from '1' (not at all helpful) to '5' (extremely helpful). Specific skills were added to the log as new skills were introduced.

2.2.2.4 Components of affective experience and well-being.: Given that we were interested in skills that promote LAP, we chose assessments of beliefs and experiences related to different emotional states, as well as measures of specific skills taught within LAUREL.

The *Affect Valuation Index* (AVI) [83] measures ideal and experienced affect. Participants were asked to rate how often they would *ideally* like to feel an emotion over the course of a week (i.e., ideal) and how they *actually* felt over the course of a week (i.e., experienced). This measure helps differentiate between affective states that people want to experience versus what they actually experience. HAP on the AVI included the emotion terms enthusiastic, excited, strong, and elated (α ideal=0.66; α actual=0.70). LAP included the emotion terms calm, rested, relaxed, peaceful, and serene (α ideal=0.83; α actual=0.86). High activation negative (HAN) included the emotion terms fearful, hostile, and nervous (α ideal=0.80; α actual=0.36). Low activation negative (LAN) included the emotion terms dull, sleepy, and sluggish (α ideal=0.18; α actual=0.65). Emotion terms on the AVI were rated on a scale from '1' (never) to '9' (all the time). Subscales for these affect domains were calculated as averages.

The *Savoring Beliefs Inventory* (SBI) [84] measures beliefs about one's capacity to savor positive experiences. The 24 items were rated on a scale from '1' (strongly disagree) to '5' (strongly agree; $\alpha=0.95$).

The *Five-Facet Mindfulness Questionnaire* [85] assesses mindfulness across 5 domains: observing ($\alpha=0.88$), describing ($\alpha=0.91$), acting with awareness ($\alpha=0.95$), accepting without judgment ($\alpha=0.95$), and nonreactivity to internal experience ($\alpha=0.90$). The 39 items were rated on a scale from '1' (never or vary rarely true) to '5' (very often or always true).

The *Emotion Regulation Questionnaire, Self-Efficacy* version (ERQ-SE [86], based on the original ERQ [87]), assesses a person's perceived capability of regulating emotions using cognitive reappraisal ($\alpha=0.88$) and suppression ($\alpha=0.56$). The 18 items were rated on a scale from '1' (strongly disagree) to '5' (strongly agree).

The *Self Compassion Scale-Short Form* [88] assesses self-compassion across six components: self-kindness, self-judgment, common humanity, isolation, mindfulness, and

over-identification (negative aspects are reversed coded; $\alpha=0.90$). The 12 items were rated on a scale from '1' (almost never) to '5' (almost always).

2.2.3 Data analysis.—Descriptive statistics are presented for demographic, clinical, and LAUREL group engagement variables (e.g., attendance, skills practice, skills helpfulness). Linear mixed effect modeling using the lme4 package for R [89] was used to evaluate the main effect of time (baseline/post-intervention) with components of mood symptoms, affective experience, and well-being. All models included a random intercept; however, they did not include random slope due to small sample size and lack of power.

3. Results of the LAUREL Proof of Concept Open Trial

3.1 Engagement in LAUREL intervention

Twelve of the 16 people enrolled in this study completed baseline and post-intervention questionnaires. Of those who completed, attendance was high (87.96%; 6 attended 9 sessions, 3 attended 8 sessions, 2 attended 6 sessions, 1 attended 5 sessions). Of the four people who did not complete post-intervention questionnaires (2 men, 2 women; 3 attended 1 session, 1 attended 3 sessions), three participants cited scheduling conflicts and one cited personal reasons for disengaging from the study.

3.2 Engagement in LAUREL skills between group sessions

Mean home practice rates were high (see Table 3). On average, participants used any combination of the ten LAUREL skills 16.37 ($SD=7.63$) times per week; however, the amount of practice varied across participants and skills. Participants practiced identifying daily positives, savoring, mindfulness, and setting attainable goals most frequently, and symptom tracking, reappraisal, and small acts of kindness least often. Furthermore, they found the skills helpful, with mean ratings ('5'=extremely helpful) for the ten LAUREL skills ranging from 3.00 ($SD=1.32$) to 4.90 ($SD=2.13$). Participants rated mindfulness and goal setting as the most helpful skills.

3.3 Changes in mood symptoms (see Table 4)

Baseline symptom severity scores (YMRS: $M=3.19$, $SD=4.00$, $Min=0$, $Max=14$; mHRSD: $M=3.13$, $SD=3.12$, $Min=0$, $Max=9$) suggest that this sample is representative of those with bipolar disorder in a period of symptom remission. Further, the number of lifetime psychiatric hospitalizations ($M=3.60$, $SD=2.37$) is consistent with the chronic and reoccurring nature of bipolar disorder.

We were unable to detect significant differences in mania symptom severity (YMRS) scores ($\beta=1.66$, $SE=1.34$, $t=1.23$, $p=0.24$) or depression symptom severity (mHRSD) scores ($\beta=0.79$, $SE=0.69$, $t=1.15$, $p=0.28$) at post-intervention compared to baseline.

3.4 Components of affect experience and well-being (see Table 4)

3.4.1 Affect experience.—On the AVI, participants reported significant changes in both *ideal* and *actual* HAP from baseline to post-intervention. Participants reported that they *ideally* wanted to experience ($\beta=-0.48$, $SE=0.17$, $t=-2.80$, $p=0.01$) and *actually* experienced

($\beta=-0.19$, $SE=0.08$, $t=-2.34$, $p=0.04$) significantly less HAP post-intervention compared to baseline. Further, participants reported experiencing significantly less HAN ($\beta=-0.33$, $SE=0.14$, $t=-2.45$, $p=0.03$) post-intervention compared to baseline. We were unable to detect significant differences between all other AVI comparisons.

3.4.2 Well-being measures.—We were unable to detect significant differences in mean savoring beliefs scores (SBI) from baseline to post-intervention. Participants reported significant improvements on the mindfulness (FFMQ) subscales of describing ($\beta=2.07$, $SE=0.91$, $t=2.29$, $p=0.04$) and nonreactivity to internal experience ($\beta=2.99$, $SE=1.33$, $t=2.26$, $p=0.04$) from baseline to post-intervention. We were unable to detect significant differences in the observing, acting with awareness, and accepting without judgment domains when comparing baseline to post-intervention. Participants reported significantly greater perceived capability of using cognitive reappraisal (ERQ-SE; $\beta=5.18$, $SE=2.23$, $t=2.33$, $p=0.04$) but not suppression at post-intervention compared to baseline. Participants reported significant improvements in self-compassion (SCS-S) at post-intervention compared to baseline ($\beta=0.41$, $SE=0.16$, $t=2.65$, $p=0.02$).

4. Discussion

In this study, we discussed the development and preliminary outcomes of a PER group treatment for people with BD, designed as a supplement to pharmacological treatment. The majority of participants who were enrolled in our study completed the LAUREL intervention, with those who dropped out citing concerns unrelated to group content. Participants who completed the treatment attended most of the group sessions and reported practicing skills frequently. Of the ten skills introduced during the LAUREL intervention, participants reported practicing identifying daily positives, savoring, mindfulness, and setting attainable goals most often. Together, these findings suggest that the structure and content of the LAUREL intervention was acceptable and the implementation of a PER intervention was feasible in this population, providing support for further investigation of the efficacy of the LAUREL intervention.

We assessed mood symptoms to effectively monitor whether the unique nature of our intervention (i.e., focusing on positive affect) could trigger mania. Overall, we were unable to detect significant differences in mania symptom severity at post-intervention. Further, no participants exhibited mania symptoms at a level concerning to group facilitators or necessitating additional support from participants' treatment providers. However, it is important to note that two participants experienced elevated mania scores (YMRS) at post-intervention (Participant 1: baseline=4; post-intervention=12; Participant 2: baseline=3; post-intervention=16; clinical cutoff score=20). It is unclear if increases in mania scores were directly related to engaging in the LAUREL intervention or other factors. Nonetheless, it will be important to monitor and evaluate the potential effect of PER interventions in inducing mania in a larger sample.

In a similar PER group intervention conducted by some of the current study authors [42], a woman with schizoaffective disorder, who was not taking psychiatric medications under the supervision of her medical provider, experienced a manic episode. Her experience

demonstrates that certain PER skills may further intensify symptoms if practice is taken to an extreme. Although LAUREL participants were repeatedly reminded about emotional balance when practicing skills, balance becomes more difficult when a person is experiencing psychiatric symptoms. Observations from both studies highlight the importance of PER interventions as a supplement to pharmacological treatments, ongoing monitoring of mood symptoms, collaboration with treatment providers, and the availability of coping responses to reestablish stability. Future iterations of this intervention would likely benefit from incorporating a session on symptom response planning to assist with addressing increases in mood symptoms should they occur.

Further, we were unable to detect decreases in mania (YMRS) and depression (mHSRD) symptoms during the intervention. As previously stated, participants who reported more than two clinically significant mania or depression symptoms were excluded from this study during the prescreening process. Thus, the lack of improvement in mood symptoms may be due to the relatively low level of symptoms at baseline.

Consistent with the target mechanism of the intervention, participants reported that they *ideally* wanted to experience and *actually* experienced significantly less HAP post-intervention as compared to baseline. This is encouraging given that extreme valuing of happiness is associated with and predictive of more severe symptoms in BD [7]. We were unable to detect significant changes in *ideal* or *actual* LAP post-intervention compared to baseline. One important way the LAUREL intervention differs from other PER interventions is its focus on emotion awareness and regulation *more generally* as we did not want participants with BD to unintentionally overvalue or intensify positive emotions to the potential detriment of their well-being. This focus on “balance,” instead of LAP emotions more specifically, may have contributed to the lack of improvement in LAP scores post-intervention. Indeed, participants reported experiencing significantly less HAN at post intervention, suggesting that PER skills may help to decrease high activation emotions (both positive and negative), which may ultimately help to foster emotional balance for a population characterized by variations in mood. It is also important to note that this preliminary study may be underpowered to detect significant differences, highlighting the need for additional studies with larger samples.

Prior studies suggest that people with BD experience difficulties with some PER strategies, though use of these skills confers potential benefits [90–94], highlighting the importance of an intervention like LAUREL. In this study, participants reported significant improvements in mindfulness, reappraisal, and self-compassion after participation in LAUREL. Mindfulness was one of the most frequently used and rated as most helpful PER skills in our study, suggesting that the skill is easily implemented in the daily lives of people with BD. Both reappraisal and self-compassion were not used as often as other skills, suggesting that reported changes at post-intervention were not directly related to the frequency of reported skills practice. Together, these data suggest that people with BD report engaging with PER strategies and find these skills helpful even with a small amount of practice.

As with any study, there are important limitations to acknowledge. First, this is a small open trial designed to examine the implementation of a PER intervention in a population

characterized by positive affect dysregulation. Results must be interpreted cautiously, keeping this small sample size in mind. Studies with larger sample sizes, comparison conditions, and longer follow-up periods are needed [22] to further examine the efficacy of the LAUREL intervention. Second, the LAUREL intervention supplemented participants' existing treatment plans, which varied based on each participant's unique needs. While the majority of participants were taking psychiatric medications (11/12), we are unable to determine if specific treatment combinations are more or less beneficial. Third, while our sample was representative of the chronic and recurrent nature of BD (i.e., participants in this study reported nearly 4 lifetime psychiatric hospitalizations), participants entered the study during a state of symptom remission. It is unclear whether participants with BD with less stable mood symptoms or currently experiencing mood episodes would benefit in the same manner as those experiencing symptom remission. Fourth, this sample was ethnically homogenous and fairly high functioning. Future studies could profitably explore cultural differences in response to and benefit from the LAUREL intervention, as there are cultural variations in *ideal* and *actual* affect [30]. Finally, scheduling was one of the identified barriers to recruitment and continued engagement in the LAUREL intervention. While individual treatment offers greater flexibility in scheduling, group interventions offer opportunities to normalize challenges and interact with peers that may outweigh the logistical benefits of individual sessions.

Despite limitations, this study offers many strengths. Data from this study demonstrate the implementation of a PER intervention for BD and provide preliminary evidence that people with BD can learn and benefit from PER skills. Given these promising results, future research is needed to examine the efficacy of the LAUREL intervention compared to other psychosocial interventions, and to unpack the specific treatment components that are necessary for improving PER in BD.

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References

1. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: Author.
2. Pompili M, Gonda X, Serafini G, Innamorati M, Sher L, Amore M, et al. (2013). Epidemiology of suicide in bipolar disorders: A systematic review of the literature. *Bipolar Disorders*, 15, 457–490. [PubMed: 23755739]
3. Folsom DP, Hawthorne W, Lindamer L, Gilmer T, Bailey A, Golshan S, ... & Jeste DV (2005). Prevalence and risk factors for homelessness and utilization of mental health services among 10,340 patients with serious mental illness in a large public mental health system. *American Journal of Psychiatry*, 162(2), 370–376. [PubMed: 15677603]
4. Grant BF, Stinson FS, Hasin DS, Dawson DA, Chou SP, Ruan WJ, & Huang B (2005). Prevalence, Correlates, and Comorbidity of Bipolar I Disorder and Axis I and II Disorders: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 66(10), 1205–1215. [PubMed: 16259532]
5. Simon NM, Otto MW, Wisniewski SR, Fossey M, Sagduyu K, Frank E, ... Pollack MH (2004). Anxiety disorder comorbidity in bipolar disorder patients: Data from the first 500 participants in the

- Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD). *American Journal of Psychiatry*, 161(12), 2222–2229. [PubMed: 15569893]
6. Reiger DA, Farmer ME, Rae DS, Locke BZ, Keith SJ, Judd LL, Goodwin FK, 1990 Comorbidity of mental disorders with alcohol and other drug abuse. Results from the epidemiologic catchment area (ECA) study. *JAMA* 264, 2511–2518. [PubMed: 2232018]
 7. Ford BQ, Mauss IB, & Gruber J (2015). Valuing happiness is associated with bipolar disorder. *Emotion*, 15(2), 211. [PubMed: 25603134]
 8. Muhtadie L, Johnson SL, Carver CS, Gotlib IH, & Ketter TA (2014). A profile approach to impulsivity in bipolar disorder: The key role of strong emotions. *Acta Psychiatrica Scandinavica*, 129, 100–108. 10.1111/acps.12136 [PubMed: 23600731]
 9. Johnson SL, & Carver CS (2016). Emotion-relevant impulsivity predicts sustained anger and aggression after remission in bipolar I disorder. *Journal of Affective Disorders*, 189, 169–175. 10.1016/j.jad.2015.07.050 [PubMed: 26437231]
 10. Johnson SL, Carver CS, & Tharp JA (2017). Suicidality in bipolar disorder: The role of emotion-triggered impulsivity. *Suicide and Life-Threatening Behavior*, 47, 177–192. doi:10.1111/sltb.12274 [PubMed: 27406282]
 11. Victor SE, Johnson SL, & Gotlib IH (2011). Quality of life and impulsivity in bipolar disorder. *Bipolar Disorders*, 13, 303–309. doi:10.1111/j.1399-5618.2011.00919.x [PubMed: 21676133]
 12. Lam D, Wong G, & Sham P (2001). Prodromes, coping strategies and course of illness in bipolar affective disorder – a naturalistic study. *Psychological Medicine*, 31(08), 1397–1402. 10.1017/S003329170100472X [PubMed: 11722154]
 13. Johnson SL, Tharp JA, Peckham AD, & McMaster KJ (2016). Emotion in bipolar I disorder: Implications for functional and symptom outcomes. *Journal of Abnormal Psychology*, 125(1), 40. 10.1037/abn0000116 [PubMed: 26480234]
 14. Fredrickson BL (1998). What Good Are Positive Emotions? *Review of General Psychology*, 2, 300–319. doi:10.1037/1089-2680.2.3.300 [PubMed: 21850154]
 15. Fredrickson BL (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56, 218–226. [PubMed: 11315248]
 16. Feldman GC, Joormann J, & Johnson SL (2008). Responses to positive affect: A self-report measure of rumination and dampening. *Cognitive Therapy and Research*, 32(4), 507–525. 10.1007/s10608-006-9083-0.Responses [PubMed: 20360998]
 17. Edge MD, Miller CJ, Muhtadie L, Johnson SL, Carver CS, Marquinez N, & Gotlib IH (2013). People with bipolar I disorder report avoiding rewarding activities and dampening positive emotion. *Journal of Affective Disorders*, 146(3), 407–413. 10.1016/j.jad.2012.07.027 [PubMed: 23021378]
 18. Gilbert KE, Nolen-Hoeksema S, & Gruber J (2013). Positive emotion dysregulation across mood disorders: How amplifying versus dampening predicts emotional reactivity and illness course. *Behaviour Research and Therapy*, 51, 736–741. [PubMed: 24076407]
 19. Peckham AD, Johnson SL, & Gotlib IH (2016). Attentional bias in euthymic bipolar I disorder. *Cognition and Emotion*, 30(3), 472–487. [PubMed: 25757517]
 20. Carl JR, Gallagher MW, & Barlow DH (2018). Development and preliminary evaluation of a positive emotion regulation augmentation module for anxiety and depression. *Behavior Therapy*, 49(6), 939–950. [PubMed: 30316492]
 21. Celano CM, Gomez-Bernal F, Mastromauro CA, Beale EE, DuBois CM, Auerbach RP, & Huffman JC (2018). A positive psychology intervention for patients with bipolar depression: A randomized pilot trial. *Journal of Mental Health*, 1–9. 10.1080/09638237.2018.1521942
 22. Kraiss JT, Peter M, Chrispijn M, Trompeter HR, Stevens AW, Neutel E, ... & Bohlmeijer ET(2018). B-positive: a randomized controlled trial of a multicomponent positive psychology intervention for euthymic patients with bipolar disorder-study protocol and intervention development. *BMC psychiatry*, 18(1), 335. [PubMed: 30333004]
 23. Hendriks T, Schotanus-Dijkstra M, Hassankhan A, de Jong J, & Bohlmeijer E (2019). The Efficacy of Multi-component Positive Psychology Interventions: A Systematic Review and Meta-analysis of Randomized Controlled Trials. *Journal of Happiness Studies*, 1–34.

24. Carroll JM, Yik MSM, Russell JA, & Barrett LF (1999). On the psychometric principles of affect. *Review of General Psychology*, 3, 14–22. doi:10.1037/1089-2680.3.1.14
25. Larsen RJ, & Diener E (1992). Promises and problems with the circumplex model of emotion In Clark MS (Ed.), *Review of personality and social psychology*, No. 13. Emotion (pp. 25–59). Thousand Oaks, CA, US: Sage Publications, Inc.
26. Russell JA, & Barrett LF (1999). Core affect, prototypical emotional episodes, and other things called emotion: dissecting the elephant. *Journal of Personality and Social Psychology*, 76, 805–819. [PubMed: 10353204]
27. Barrett LF (2004). Feelings or Words? Understanding the Content in Self-Report Ratings of Experienced Emotion. *Journal Of Personality and Social Psychology*, 87, 266–281. doi: 10.1037/0022-3514.87.2.266 [PubMed: 15301632]
28. Tugade MM, Fredrickson BL, & Barrett LF (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. *Journal of Personality*, 72, 1161–1190. [PubMed: 15509280]
29. Barrett LF, Gross J, Christensen TC, & Benvenuto M (2001). Knowing what you're feeling and knowing what to do about it: Mapping the relation between emotion differentiation and emotion regulation. *Cognition & Emotion*, 15, 713–724.
30. Tsai JL & Park BK (2014). The cultural shaping of happiness: The role of ideal affect In Moskowitz J & Gruber J (Eds.), *The light and dark sides of positive emotion* (pp. 345–362). Oxford: Oxford University Press.
31. Moreno PI, Moskowitz AL, Ganz PA, & Bower JE (2016). Positive affect and inflammatory activity in breast cancer survivors: examining the role of affective arousal. *Psychosomatic Medicine*, 78, 532–541. doi:10.1097/PSY.0000000000000300 [PubMed: 26867077]
32. Ma LK, Tunney RJ, & Ferguson E (2017). Does gratitude enhance prosociality: A meta-analytic review. *Psychological Bulletin*, 143, 601–635. [PubMed: 28406659]
33. Zeng X, Chiu CP, Wang R, Oei TP, & Leung FY (2015). The effect of loving-kindness meditation on positive emotions: a meta-analytic review. *Frontiers in Psychology*, 6, 1–14. doi:10.3389/fpsyg.2015.01693 [PubMed: 25688217]
34. Pearlstein JG, Johnson SL, Modavi K, Peckham AD, & Carver CS (2018). Neurocognitive mechanisms of emotion- related impulsivity: The role of arousal. *Psychophysiology*, e13293. [PubMed: 30259983]
35. Johnson SL, Edge MD, Holmes MK, & Carver CS (2012). The behavioral activation system and mania. *Annual Review of Clinical Psychology*, 8, 243–267.
36. Fulford D, Johnson SL, Llabre MM, & Carver CS (2010). Pushing and coasting in dynamic goal pursuit: Coasting is attenuated in bipolar disorder. *Psychological Science*, 21(7), 1021–1027. 10.1177/0956797610373372.Pushing [PubMed: 20519486]
37. Hayden EP, Bodkins M, Brenner C, Shekhar A, Nurnberger JI Jr, O'Donnell B, & Hetrick WP (2008). A multimethod investigation of the Behavioral Activation System in bipolar disorder. *Journal of Abnormal Psychology*, 117(1), 164. [PubMed: 18266494]
38. Johnson SL, Carver CS, & Gotlib IH (2012). Elevated ambitions for fame among persons diagnosed with bipolar I disorder. *Journal of Abnormal Psychology*, 121(3), 602–9. 10.1037/a0026370 [PubMed: 22103804]
39. Johnson SL, Sandrow D, Meyer B, Winters R, Miller I, Solomon D & Keitner G (2000). Increases in manic symptoms after life events involving goal attainment. *Journal of Abnormal Psychology*, 109(4), 721–727. [PubMed: 11195996]
40. Johnson SL, Cuellar AK, Ruggero C, Winett-Perlman C, Goodnick P, White R, & Miller I (2008). Life events as predictors of mania and depression in bipolar I disorder. *Journal of Abnormal Psychology*, 117(2), 268–277. [PubMed: 18489203]
41. Nusslock R, Abramson LY, Harmon-Jones E, Alloy LB, & Hogan ME (2007). A goal-striving life event and the onset of hypomanic and depressive episodes and symptoms: perspective from the behavioral approach system (BAS) dysregulation theory. *Journal of Abnormal Psychology*, 116(1), 105–115. [PubMed: 17324021]

42. Caponigro JM, Moran EK, Kring AM, & Moskowitz JT (2014). Awareness and coping with emotion in schizophrenia: Acceptability, feasibility and case illustrations. *Clinical Psychology & Psychotherapy*, 21(4), 371–380. [PubMed: 23553953]
43. Addington E, Cheung EO, & Moskowitz JT (2018). Positive affect skills may improve pain management in people with HIV. *Journal of Health Psychology*. 10.1177/1359105318769355
44. Bassett SM, Cohn M, Cotten P, Kwok I, & Moskowitz JT (2019). Feasibility and acceptability of an online positive affect intervention for those living with comorbid HIV depression. *AIDS and Behavior*, 23(3), 753–764. [PubMed: 30701389]
45. Carrico AW, Gómez W, Siever MD, Discepolo MV, Dilworth SE, & Moskowitz JT (2015). Pilot randomized controlled trial of an integrative intervention with methamphetamine-using men who have sex with men. *Archives of Sexual Behavior*, 44(7), 1861–1867. [PubMed: 26123068]
46. Carrico AW, Jain J, Discepolo MV, Olem D, Andrews R, Woods WJ, Neilands TB, Shoptaw S, Gómez W, Dilworth SE, & Moskowitz JT (2016). A community-engaged randomized controlled trial of an integrative intervention with HIV-positive, methamphetamine-using men who have sex with men. *BMC Public Health*, 16(1), 673. [PubMed: 27476110]
47. Carrico AW, Gómez W, Jain J, Shoptaw S, Discepolo MV, Olem D, Lagana-Jackson J, Andrews R, Neilands TB, Dilworth SE, Evans JL, Woods WJ, & Moskowitz JT (in press). Randomized Controlled trial of a positive affect intervention for methamphetamine users. *Drug and Alcohol Dependence*.
48. Cheung EO, Cohn MA, Dunn LB, Melisko ME, Morgan S, Penedo FJ, ... & Moskowitz JT (2017). A randomized pilot trial of a positive affect skill intervention (lessons in linking affect and coping) for women with metastatic breast cancer. *Psychooncology*, 26(12), 2101–2108. [PubMed: 27862646]
49. Cheung EO, Addington EL, Bassett SM, Schuette SA, Shiu EW, Cohn MA, Leykin Y, Saslow LR, & Moskowitz JT (2018). A self-paced, web-based, positive emotion skills intervention for reducing symptoms of depression: protocol for development and pilot testing of MARIGOLD. *JMIR research protocols*, 7(6), e10494. [PubMed: 29871853]
50. Cohn MA, Pietrucha ME, Saslow LR, Hult JR, & Moskowitz JT (2014). An online positive affect skills intervention reduces depression in adults with type 2 diabetes. *Journal of Positive Psychology*, 9(6), 523–534. [PubMed: 25214877]
51. Dowling GA, Merrilees J, Mastick J, Chang VY, Hubbard E, & Moskowitz JT (2014). Life enhancing activities for family caregivers of people with frontotemporal dementia. *Alzheimer Disease & Associated Disorders*, 28(2), 175–181. [PubMed: 24113564]
52. Hernandez R, Daviglius ML, Martinez L, Durazo-Arvizu RA, Huffman J, Ramirez F, ... & Moskowitz JT (2019). “iAlegrete!”—A culturally adapted positive psychological intervention for Hispanics/Latinos with hypertension: Rationale, design, and methods. *Contemporary Clinical Trials Communications*, 100348 10.1016/j.conctc.2019.100348 [PubMed: 30984888]
53. Hernandez R, Burrows B, Wilund K, Cohn M, Xu S, Moskowitz JT (In press) Feasibility of an internet-based positive psychological intervention for hemodialysis patients with symptoms of depression. *Social Work in Health Care*.
54. Hernandez R, Cheung E, Carnethon M, Penedo FJ, Moskowitz JT, Martinez L, & Schueller SM (in press) Feasibility of a culturally adapted positive psychological intervention for Hispanics/Latinos with elevated risk for cardiovascular disease. *Translational Behavioral Medicine*.
55. Moskowitz JT, Carrico AW, Cohn M, Duncan LG, Bussolari C, Layous K, Hult JR, Brousset A, Cotten P, Maurer S, Pietrucha ME, Acree M, Wrubel J, Johnson MO, Hecht FM, & Folkman S (2014). Randomized controlled trial of a positive affect intervention to reduce stress in people newly diagnosed with HIV: Protocol and design for the IRISS study. *Open Access Journal of Clinical Trials*, 6.
56. Moskowitz JT, Carrico AW, Duncan LG, Cohn MA, Cheung EO, Batchelder A, Martinez L, Segawa E, Acree M, & Folkman S (2017). Randomized controlled trial of a positive affect intervention for people newly diagnosed with HIV. *Journal of Consulting and Clinical Psychology*, 85(5), 409. [PubMed: 28333512]
57. Moskowitz JT, Cheung EO, Snowberg K, Verstaen A, Merrilees J, Salsman JM, & Dowling GA (in press) Randomized controlled trial of a facilitated online positive emotion regulation intervention for dementia caregivers. *Health Psychology*.

58. Verstaen A, Moskowitz JT, Snowberg KE, Merrilees J, & Dowling GA (2018). Life Enhancing Activities for Family Caregivers of people with dementia: Protocol for a randomized controlled trial of a positive affect skills intervention. *Open Access Journal of Clinical Trials*, 10, 1–12.
59. Moskowitz JT (2010). Coping interventions and the regulation of positive affect. *Handbook of Stress, Health and Coping*, 407–427.
60. Butler M, Urosevic S, Desai P, Sponheim SR, Popp J, Nelson VA, ... & Sunderlin B. (2018). Treatment for Bipolar Disorder in Adults: A Systematic Review.
61. Hollis V, Konrad A, & Whittaker S (2015, 4). Change of heart: Emotion tracking to promote behavior change. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems* (pp. 2643–2652). ACM.
62. Lewinsohn PM, & Amenson CS (1978). Some relations between pleasant and unpleasant mood-related events and depression. *Journal of Abnormal Psychology*, 87(6), 644–654. [PubMed: 739087]
63. Lewinsohn PM, Sullivan M, Grosscup SJ (1980). Changing reinforcing events: An approach to the treatment of depression. *Psychotherapy: Theory, Research, and Practice*, 17(3), 322–334.
64. Krause N (1998) Positive life events and depressive symptoms in older adults. *Behavioral Medicine*, 14(3), 101–112.
65. Langston CA. (1994). Capitalizing on and coping with daily-life events: Expressive responses to positive events. *Journal of Personality and Social Psychology*, 67(6), 1112–1125.
66. Kabat-Zinn J (2003) Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10(2), 144–156.
67. Folkman S (1997). Positive psychological states and coping with severe stress. *Social Science & Medicine*, 45, 1207–1221. [PubMed: 9381234]
68. Sears SR, Stanton AL, & Danoff-Burg S (2003). The yellow brick road and the emerald city: Benefit finding, positive reappraisal coping and posttraumatic growth in women with early-stage breast cancer. *Health Psychology*, 22(5), 487–497. [PubMed: 14570532]
69. Carver CS, & Scheier MF (1994) Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology*, 66(1), 184–195. [PubMed: 8126648]
70. Emmons RA (2007). *Thanks!: How the new science of gratitude can make you happier*. Houghton Mifflin Harcourt.
71. Kashdan TB, Uswatte G, & Julian T (2006). Gratitude and hedonic and eudaimonic well-being in Vietnam war veterans. *Behaviour Research and Therapy*, 44(2), 177–199. [PubMed: 16389060]
72. Musick MA, & Wilson J (2003). Volunteering and depression: The role of psychological and social resources in different age groups. *Social Science & Medicine*, 56(2), 259–269. [PubMed: 12473312]
73. Brown SL, Nesse RM, Vinokur AD, & Smith DM (2003). Providing social support may be more beneficial than receiving it: Results from a prospective study of mortality. *Psychological Science*, 14(4), 320–327. [PubMed: 12807404]
74. Penner LA, Dovidio JF, Piliavin JA, & Schroeder DA (2005). Prosocial behavior: Multilevel perspectives. *Annual Review of Psychology*, 56, 365–392.
75. Neff KD, & Germer CK (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology*, 69, 28–44. [PubMed: 23070875]
76. Brunstein JC, Schultheiss OC, & Grassmann R (1998). Personal goals and emotional well-being: The moderating role of motive dispositions. *Journal of Personality and Social Psychology*, 75(2), 494–508. [PubMed: 9731321]
77. American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (revised 4th ed.). Washington, DC: Author.
78. Wechsler D (2001). *Wechsler Test of Adult Reading: WTAR*. San Antonio, TX: The Psychological Corporation.
79. First M, Spitzer R, Gibbon M, & Williams J (1994). *Structured clinical interview for axis I DSM-IV disorders—Patient edition (SCID-I/P, version 2.0)*. New York: Biometrics Research Department.

80. Young RC, Biggs JT, Ziegler VE, & Meyer DA (1978). A rating scale for mania: reliability, validity and sensitivity. *The British Journal of Psychiatry*, 133(5), 429–435. [PubMed: 728692]
81. Miller IW, Bishop S, Norman WH, & Maddever H (1985). The modified Hamilton rating scale for depression: reliability and validity. *Psychiatry Research*, 14(2), 131–142. [PubMed: 3857653]
82. Zimmerman M, Martinez JH, Young D, Chelminski I, & Dalrymple K (2013). Severity classification on the Hamilton depression rating scale. *Journal of Affective Disorders*, 150(2), 384–388.
83. Tsai JL, Knutson B, & Fung HH (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology*, 90, 288–307. [PubMed: 16536652]
84. Bryant F (2003). Savoring Beliefs Inventory (SBI): A scale for measuring beliefs about savouring. *Journal of Mental Health*, 12(2), 175–196.
85. Baer RA, Smith GT, Hopkins J, Krietemeyer J, & Toney L (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27–45. [PubMed: 16443717]
86. Goldin PR, Ziv M, Jazaieri H, Werner K, Kraemer H, Heimberg RG, & Gross JJ (2012). Cognitive reappraisal self-efficacy mediates the effects of individual cognitive-behavioral therapy for social anxiety disorder. *Journal of Consulting and Clinical Psychology*, 80(6), 1034. [PubMed: 22582765]
87. Gross JJ, & John OP (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85(2), 348. [PubMed: 12916575]
88. Raes F, Pommier E, Neff KD, & Van Gucht D (2011). Construction and factorial validation of a short form of the self-compassion scale. *Clinical Psychology & Psychotherapy*, 18(3), 250–255. [PubMed: 21584907]
89. Bates Douglas, Maechler Martin, Bolker Ben, Walker Steve (2015). Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software*, 67(1), 1–48. doi:10.18637/jss.v067.i01
90. Deckersbach T, Hölzel BK, Eisner LR, Stange JP, Peckham AD, Dougherty DD, ... Nierenberg AA (2012). Mindfulness-Based Cognitive Therapy for nonremitted patients with bipolar disorder. *CNS Neuroscience Therapeutics*, 18(2), 133–141. 10.1111/j.1755-5949.2011.00236.x [PubMed: 22070469]
91. Gilbert K, & Gruber J (2014). Emotion regulation of goals in bipolar disorder and major depression: A comparison of rumination and mindfulness. *Cognitive Therapy and Research*, 38(4), 375–388. 10.1007/s10608-014-9602-3
92. Gruber J, Hay AC, & Gross JJ (2014). Rethinking emotion: cognitive reappraisal is an effective positive and negative emotion regulation strategy in bipolar disorder. *Emotion*, 14(2), 388–96. 10.1037/a0035249 [PubMed: 24364852]
93. Dodd A, Lockwood E, Mansell W, & Palmier-Claus J (2019). Emotion regulation strategies in bipolar disorder: A systematic and critical review. *Journal of Affective Disorders*, 246, 262–284. 10.1016/j.jad.2018.12.026 [PubMed: 30590289]
94. Døssing M, Nilsson KK, Svejstrup SR, Sørensen VV, Straarup KN, & Hansen TB (2015). Low self-compassion in patients with bipolar disorder. *Comprehensive Psychiatry*, 60, 53–58. [PubMed: 25935462]

Table 1.

Description of LAUREL Group Sessions

Group Session	Content	Skill(s)	Home Practice
Week 1: Introduction to bipolar disorder	Psychoeducation about the symptoms of mania and depression; Differentiating between warning signs and triggers for mania and depression	(1) Identifying warning signs and triggers for mood symptoms	Complete log identifying personal warning signs, triggers, and coping responses for mania and depression symptoms
Week 2: Emotion education	Introduction to the affective circumplex model of emotion, including differentiating between high activation positive (HAP), low activation positive (LAP), high activation negative (HAN), and low activation negative (LAN) emotions	(2) Emotion tracking	Complete a daily log of emotions experienced
Week 3: Noticing and savoring positive experiences	Psychoeducation on the ways depression and mania can influence awareness of positive experiences (e.g., dampening or over-amplifying the experience); Savoring exercise with a piece of candy	(3) Identifying positive experiences (4) Savoring positive experiences	Complete a daily log of (a) a positive event, (b) the emotion felt after the event, and (c) method for savoring positive feelings
Week 4: Mindfulness	Defining mindfulness; Mindfulness practice (e.g., deep breathing, mindful walking/listening exercises)	(5) Mindfulness	Complete a daily log of mindfulness practices; Members received a CD of different mindfulness exercises
Week 5: Reappraisal	Defining reappraisal as changing one's thoughts related to an event by being mindful of both the positive and negative aspects of the situation; Psychoeducation about how mania and depression can influence appraisals of situations; Discussion of when reappraisal may be helpful	(6) Reappraisal	Complete a log describing events or situations where reappraisal was helpful during the week
Week 6: Gratitude and small acts of kindness	Psychoeducation about the psychological benefits of gratitude and altruism; Emphasis on small acts of kindness that are small, quick, and free	(7) Gratitude (8) Altruism (small acts of kindness)	Complete a daily log of gratitude practice; Complete a daily log of small acts of kindness
Week 7: Selfcompassion	Psychoeducation about the benefits of self-compassion; Loving kindness meditation practice	(9) Self-compassion	Complete a daily log of selfcompassion; Complete selfcompassion letter writing exercise
Week 8: Setting and achieving attainable goals	Discussion of adaptive responses to setting and achieving goals (e.g., savoring the achievement); Psychoeducation about warning signs of mania associated with goal setting (e.g., losing sleep in attempts to accomplish more and more goals); Description of attainable goals (realistic, clear, not too easy and not too hard, and has a clear end point)	(10) Setting and achieving goals	Complete a daily log of setting one small, attainable goal each day and method for savoring the accomplishment of the goal
Week 9: Feedback and implementation	Review of skills learned during group; Discussion of which skills were most helpful; Discussion of how members would continue to implement skills in their daily lives	N/A	Continue to practice helpful skills after the end of group

Table 2.

Baseline Demographic and Clinical Characteristics of all Participants Enrolled

	Completers (n=12)	Non-Completers (n=4)	Total (n=16)
Male (%)	50%	50%	50%
Age (M, SD)	45.33 (12.29)	36.75 (13.67)	43.19 (12.76)
Years of Education (M, SD)	16.17 (1.64)	14.75 (2.06)	15.81 (1.80)
Married (%)	33%	75%	44%
Caucasian (%)	83%	75%	88%
Number of hospitalizations (M, SD)	2.43 (1.13)	6.33 (2.31)	3.60 (2.37)
On psychiatric medications (%)	91.67%	100%	94%
WTAR	110.27 (6.03)	105.75 (8.73)	109.07 (6.83)
YMRS (M, SD)	2.83 (3.04)	4.25 (6.65)	3.19 (4.00)
mHRSD (M, SD)	3.25 (2.86)	2.75 (4.27)	3.13 (3.12)

Note. WTAR= Wechsler Test of Adult Reading; YMRS=Young Mania Rating Scale; mHRSD=Modified Hamilton Rating Scale for Depression; YMRS and mHRSD are reported as total scores.

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Table 3.

LAUREL Skills Practice and Helpfulness Scores (n=12)

		Weekly Skill Practice	Helpfulness	Average Weekly Practice Throughout Group
Skill	<i>N</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Symptom Tracking	10	5.00 (2.16)	3.44 (0.88)	2.44 (2.01)
Emotion Tracking	10	4.80 (2.35)	3.88 (1.13)	2.89 (1.92)
Daily Positives	9	5.00 (2.12)	4.11 (0.78)	3.26 (1.26)
Savoring	9	5.00 (2.12)	4.00 (0.71)	3.09 (1.30)
Mindfulness	10	4.90 (2.13)	4.00 (1.05)	3.35 (2.31)
Reappraisal	9	3.67 (1.94)	3.00 (1.32)	2.47 (1.62)
Gratitude	10	4.00 (2.06)	3.80 (1.03)	2.57 (1.44)
Small Acts of Kindness	10	3.90 (1.79)	4.00 (0.82)	2.18 (1.40)
Self-Compassion	6	3.67 (1.63)	3.33 (1.37)	2.76 (1.34)
Attainable Goals	10	4.90 (2.08)	3.60 (1.27)	3.68 (2.02)
Average number of skills practiced each week: 16.37 (7.63)				

Note. *N*=number of participants who turned in the weekly practice log; weekly skill practice=mean number of days the skill was practiced the week after the skill was introduced (max=7); helpfulness=mean helpfulness rating the week after the skill was introduced (1=not at all helpful, 5=very helpful); Average Weekly Practice Throughout the Group=mean number of days the skill was practiced divided by the number of weeks the skill was available to practice (e.g., a skill introduced in session 3 could be practiced for 6 weeks).

Table 4.

Pre-/Post-Intervention Emotion Experience and Well-Being Measures (n=12)

Measures	Baseline Score	Post-Intervention Score	<i>p</i> value
YMRS	2.83 (3.04)	4.67 (5.65)	0.24
mHRSD	3.00 (2.86)	3.82 (3.87)	0.28
Ideal HAP	3.77 (0.51)	3.30 (0.57)	0.01 *
Actual HAP	2.69 (0.66)	2.50 (0.60)	0.04 *
Ideal LAP	4.57 (0.48)	4.00 (0.78)	0.13
Actual LAP	2.90 (0.74)	2.75 (0.88)	0.19
Ideal HAN	1.22 (0.38)	1.28 (0.42)	0.63
Actual HAN	2.06 (0.58)	1.78 (0.41)	0.03 *
Ideal LAN	1.42 (0.47)	1.47 (0.64)	0.95
Actual LAN	2.25 (0.68)	2.03 (0.58)	0.16
SBI Total Score	27.17 (21.86)	29.83 (22.37)	0.43
FFMQ: Observing	26.00 (6.38)	27.33 (6.43)	0.37
FFMQ: Describing	28.92 (7.82)	31.00 (7.52)	0.04 *
FFMQ: Acting with Awareness	24.08 (8.24)	25.58 (7.76)	0.21
FFMQ: Accepting without Judgment	24.25 (8.23)	28.33 (6.39)	0.07
FFMQ: Nonreactivity to Internal Experience	17.08 (5.58)	20.50 (3.06)	0.04 *
ERQ-SE: Reappraisal subscale	23.83 (7.92)	28.75 (8.13)	0.04 *
ERQ-SE: Suppression subscale	14.67 (4.31)	13.50 (6.59)	0.55
SCS-S	2.52 (0.88)	2.99 (0.53)	0.02 *

Note. YMRS=Young Mania Rating Scale; mHRSD=Modified Hamilton Rating Scale for Depression; HAP=High Activation Positive; LAP=Low Activation Positive; HAN=High Activation Negative; LAN=Low Activation Negative; SBI=Savoring Belief's Inventory; FFMQ=5-Facet Mindfulness Questionnaire; ERQ-SE=Emotion Regulation Questionnaire-Self Efficacy; SCS-S=Self-Compassion Scale-Short;

* denotes significance ($p < 0.05$).