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Upregulating Positive Emotion in Generalized Anxiety Disorder: A Randomized Controlled Trial of the SkillJoy Ecological Momentary Intervention

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Abstract

Objective: This study sought to determine if upregulating positive emotion both reduces symptoms and increases well-being for those with generalized anxiety disorder (GAD).

Method: Eighty-five participants were diagnosed with GAD by both questionnaire and clinical interview. They were then randomly assigned to one of two seven-day smartphone-delivered ecological momentary interventions (EMIs). *SkillJoy*, a savoring ecological momentary intervention, prompted participants to attend to positive aspects of the present moment, engage in and savor planned enjoyable activities, record and reflect on recent positive experiences, note events that turned out well, and look forward to positive events. The active self-monitoring control (ASM) mirrored SkillJoy's activities and wording, yet omitted savoring. It included attending to current thoughts and feelings, planning everyday activities, remembering and recording daily events, and anticipating important events. Participants were assessed at pre- and posttreatment with a 30th day follow-up. Linear mixed models and simple slope analyses with multiple imputation examined outcome change between and within conditions.

Results: Pretrial to posttrial, SkillJoy (vs. ASM) led to significantly greater reductions in worry and increases in positive emotions and savoring. Depression symptoms significantly decreased for both EMIs. Pretrial to follow-up, SkillJoy (vs. ASM) users showed significantly greater increases in savoring. Both SkillJoy and ASM significantly decreased worry ($d = -1.02$ vs. -0.51) and depression ($d = -1.09$ vs. -0.63) pre-to-follow-up, yet SkillJoy had greater effect sizes. SkillJoy significantly increased positive emotions and savoring pre-to-follow-up, yet ASM did not.

Conclusion: SkillJoy may strengthen positive emotions and skills for enhancing them, while also reducing worry.

Keywords

generalized anxiety disorder; savoring; positive emotion; ecological momentary intervention; worry

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Positive emotions have been relatively understudied in clinical psychology. Initial evidence suggests optimizing *positive* emotional functioning may enhance resilience and long-term recovery, while also reducing acute symptoms (Craske et al., 2019; Garland et al., 2010; Sin & Lyubomirsky, 2009). Across studies, positive emotions have broadened cognitive attention, increased attentional flexibility, facilitated greater awareness of positive stimuli, expanded paths of action, and facilitated better learning and longer learning attention spans (see Fredrickson, 2013, for a review). These effects may facilitate symptom change: A 15-week positive affect-focused treatment for elevated anxiety and depression increased positive affect and reduced depression and anxiety to a greater degree than a negative affect-focused treatment (Craske et al., 2019). Savoring is one strategy for upregulating positive emotion (Bryant, 2003). It involves attending to and enjoying positive feelings, thoughts, and actions, as well as purposefully extending their duration. Savoring has increased well-being (see review; Smith & Bryant, 2017) and reduced psychopathology (see meta-analysis; Sin & Lyubomirsky, 2009) in multiple studies.

Generalized anxiety disorder (GAD) has several core problems that may be treated by upregulating positive emotion. These problems include hypervigilance to threat, dismissing positive feelings with worry, perseveration, and inaccurate negative predictions about future outcomes (e.g., LaFreniere & Newman, 2020). Newman and Llera's (2011) empirically supported contrast avoidance model suggests those with GAD maintain anxiety with worry in order to prevent future unexpected spikes in negative emotion. Since those with GAD maintain distress to protect against mood shifts, they are less likely to dwell on positive feelings for long. In fact, GAD has been linked to purposefully lessening positive emotion—a suppressive regulation strategy known as “kill-joy thinking” (Quoidbach et al., 2010).

Upregulating positive emotion may offer a solution for worry's “kill-joy” contrast avoidance function and other GAD problems. At a basic level, positive emotions interfere with negative emotions (such as anxiety and depression-related sadness or malaise; Garland et al., 2010). Moreover, if those with GAD sustain positive emotions until natural exposure to negative emotional shifts, it may foster habituation to contrasts and acceptance of contrast vulnerability. Positive emotions may also may reduce focus on perceived present and future threat signals by broadening cognition: Accessing positive mental content attenuates attentional bias to negative information (Fredrickson, 2013). These functions may counter GAD maintenance factors like threat bias, “kill-joy” strategies, and perseveration. Increased positive emotions and savored activities may also lessen the anhedonia central to comorbid depression (Craske et al., 2019).

The present study tested a novel ecological momentary intervention (EMI) for practicing savoring strategies—*SkillJoy*. We sought to determine if SkillJoy could train greater savoring, reduce worry, and increase positive emotion in GAD relative to an active control. We proposed that the SkillJoy EMI would reduce worry and depression and increase positive emotion and savoring to a greater degree than the control after 7 days of use and at 30th day follow-up.

Method

The sample included 85 participants (41 SkillJoy, 44 control; 77 women, 8 men; all students ages 18 to 24), surpassing our power analysis requirement of 70. Participants had to meet *DSM-5* criteria for GAD on the *Generalized Anxiety Disorder Questionnaire-IV* (Newman et al., 2002) in a university subject pool mass battery screening to be invited by email to participate. The sample mean GAD-Q-IV score was 10.09 (lowest = 6.75), all surpassing the clinical cutoff of 5.7. Baseline symptom measure scores were highly similar to those of community-based, treatment-seeking GAD samples (e.g., Newman et al., 2011). Those who accepted the invitation were assessed for GAD again by structured clinical interview (the GAD section of the Mini-International Neuropsychiatric Interview [MINI]) by trained doctoral and undergraduate research assistants on the phone. They had to meet GAD criteria on both the GAD-Q-IV and the MINI to participate. Note our GAD assessment could not fully rule out other disorders, substances, or medical conditions that may account for GAD symptoms. Thus, the diagnostic status of those in our sample can be described as “probable GAD.” Yet for article readability, we refer to probable GAD status simply as “GAD” throughout. Participants received subject pool credit sufficient to complete their total course requirement regardless of compliance. For the few who went over credit hour caps, they received \$5 per extra hour. 82.4% identified as White, 4.7% as Black, 4.7% as Asian, 3.5% as multiracial, 3.5% as Latinx, and 1.2% as Middle Eastern. Eighty-five participants completed posttrial measures; 60 completed follow-up (see Figure 1).

An institutional review board approved this study. It conforms to the Transparency and Openness Promotion guidelines. It was registered on <https://ClinicalTrials.gov> (ID: [NCT05040061](https://ClinicalTrials.gov/record/study/NCT05040061)). Both EMIs underwent extensive pilot testing with focus groups. All data were collected prior to the COVID-19 pandemic. Eligible participants were randomly assigned to either the SkillJoy treatment or the active self-monitoring (ASM) control condition by a random number generator. They first completed informed consent and baseline questionnaires using PsychData. Measures included *The Penn State Worry Questionnaire* (PSWQ), a validated, reliable scale of the severity/frequency of worry (Meyer et al., 1990)¹; *The Positive and Negative Affect Schedule Expanded Form: Joviality Scale* (PANAS-X Joviality; Watson & Clark, 1994), a validated, reliable measure of positive emotions; *The Savoring Beliefs Inventory: Savoring the Moment* (SBI), a validated, reliable survey that measures savoring of present moment emotional experience (Bryant, 2003); and *The Beck Depression Inventory II* (BDI-II), a validated, reliable measure of depression symptoms (Beck et al., 1996). After, they underwent a condition-specific training session with psychoeducation, hands-on practice exercises, and rationales for how their EMI would lead to benefits (see Supplemental Materials). They were trained in their app and planned for study steps.

Each EMI was delivered by the PACO smartphone app for seven days in participants' natural environments. Each day participants received nine prompts (one was solely

¹Internal consistencies for each measure in our sample were as follows: PSWQ: $\alpha = .78$ pretrial, $.87$ posttrial, $.89$ at follow-up; PANAS-X Joviality: $\alpha = .90$ pretrial, $.88$ posttrial, $.92$ follow-up; SBI Moment: $\alpha = .80$ pretrial, $.86$ posttrial, $.84$ follow-up; BDI-II: $\alpha = .88$ pretrial; $.93$ posttrial; $.95$ follow-up.

a reminder). Prompts included identical momentary ratings between conditions. See Supplemental Materials for EMI prompts, their timing (based on pilot testing), and a descriptive table. They also received an expected phone call checking compliance on Day 5 (they were informed of it in the initial session). On the eighth day of the study, they returned and completed questionnaires. Their access to the app was removed at that time. On the 30th day, they completed follow-up measures online.

SkillJoy EMI

SkillJoy included a variety of savoring interventions modified to target GAD pathology: (a) *Enjoyable activity savoring*. Participants received a prompt at a user-editable time before 11:30 a.m. to schedule an exact time for an enjoyable activity for the following day. They were then reminded (in this prompt) and later prompted (in a fixed reminder prompt) to practice savoring upcoming positive activities. At the end of the day, they were asked to focus on what they liked about their enjoyable activity; (b) *Present moment positive evaluation*. Participants received three identical daily stratified random prompts guiding them to focus on and savor what they enjoyed about the present moment; (c) *Savoring recent memories*. They received two fixed daily prompts that encouraged reflective savoring of recent activities and events; (d) “*Counting blessings*” technique. Twice a day they received fixed prompts guiding them to consider and write about events that turned out better than expected and events that were enjoyable or went well. (d) *Looking forward to the day’s events*. During their day’s first prompt, participants were asked to savor anticipation of an upcoming positive activity that day.

Active Self-Monitoring Control EMI

The ASM control included self-monitoring activities mirroring SkillJoy’s interventions, timing, and language, but omitting components for increasing or sustaining positive emotion. Careful attention was paid to match SkillJoy in its exact structure, wording, timing, and tone. Within prompts, they received reminders to pay attention to their thoughts and feelings (instead of SkillJoy’s reminders to savor positive emotion). Tasks included: (a) *Planning tomorrow’s activities*. Each morning they received a user-editable prompt to schedule “the day’s major events” for the next day; (b) *In-the-moment thoughts and feelings*. They received three identical stratified random prompts to attend to their thoughts and feelings at that present moment. In addition, they received a separate fixed reminder prompt reminding them to be aware of their thoughts, feelings, and plans in general. (c) *Remembering*. They received two fixed prompts that encouraged remembering events from their day, no matter what events these were, taking 60s to remember an event in detail. (d) *Recording the day’s events*. During the day, they received two fixed prompts guiding them to think about and record recent events. Near bedtime (at a user-editable time), they were prompted to remember their events, thoughts, and feelings from that day. They wrote down three of the day’s events and reflected on the most salient event. (d) *Anticipating the day’s biggest event*. In each day’s initial prompt, they were asked to anticipate and record the day’s most important upcoming event.

Regarding statistical analyses, we used multiple imputation with 100 iterations of the Markov Chain Monte Carlo method to account for missing data (10 imputed datasets).

For all efficacy analyses, longitudinal linear mixed models (multilevel modeling) compared trends of change across time on all outcome measures between conditions. These models all included the intercept, linear time trend, condition, and interaction between time trend and condition as fixed effects and the intercept as a random effect. It used a diagonal covariance matrix and REML estimation (100 max. iterations). The degrees of freedom were obtained by Satterthwaite approximation. Separate models were run to examine the change from pre-to posttrial and from pretrial to the 30th day. Simple slope analyses were conducted for each outcome within each condition. Between-condition differences in baseline measures, missingness, and compliance rates were examined with independent samples *t* tests. Cohen's *d* was calculated with a formula fit for multilevel models, $d = 2t/(\sqrt{df})$, and in the traditional manner for *t* tests.

Results

Descriptive Statistics and Baseline Group Difference Tests

See Table 1 for outcome means and standard deviations. 8.24% of values were missing across all timepoints, 1.77% across pre- and posttrial. Missing values analysis revealed no nonrandom patterns, passing Little's Missing Completely at Random test, $\chi^2(58) = 57.45$, $p = .496$, and number of missing values did not differ between conditions, $t(83) = 1.10$, $p = .273$, $d = 0.24$. Average compliance rate was 92.63% of prompts completed. There was no difference in compliance between SkillJoy ($M = 91.85\%$, $SD = 16.36$) and ASM ($M = 93.36\%$, $SD = 13.16$), $t(83) = 0.47$, $p = .639$, $d = 0.10$. Baseline measure scores did not differ between conditions (see Supplemental Materials).

Penn State Worry Questionnaire

There was a significant pre-to-posttime by condition interaction (see Table 2) showing a greater reduction in worry from SkillJoy than ASM with a large effect size ($d = -1.66$). Simple slope analyses found that SkillJoy users significantly decreased in worry with a large effect size ($d = -1.39$), whereas controls did not significantly decrease (see Table 3). From pre-to-follow-up, there was a marginally significant interaction between time and condition favoring SkillJoy² ($d = -.92$; Table 2). Simple slope analyses showed that SkillJoy significantly decreased worry with nearly twice the slope ($B = -8.49$) and effect size ($d = -1.02$) of ASM ($B = -4.28$, $d = -0.51$; Table 3), which also led to a significant decrease.³

PANAS-X Joviality

There was a significant difference in increasing positive emotions from pre-to-posttreatment (Table 2) favoring SkillJoy (vs. ASM) users. Simple slopes demonstrated that SkillJoy users significantly increased in positive emotions, whereas controls did not change (Table 3). From pre-to-follow-up, there was a significant increasing trend in positive emotions across

²We cautiously interpreted *p* values that were less than .10 but greater than .05 as "marginally significant" when the corresponding effect sizes were also large ($d > .08$). *p* values are best interpreted within the context of effect size, Perdices, M. (2018). Null hypothesis significance testing, *p* values, effects sizes and confidence intervals. *Brain Impairment*, 19(1), 70–80. <https://doi.org/10.1017/BrImp.2017.28>. By representing strength or degree of difference instead of surpassing an a priori threshold (e.g., $p = .05$), effect size may be more informative than *p* values in certain contexts (such as a high-control comparison).

³For the PSWQ, 60% of SkillJoy users and 45.24% of controls surpassed the reliable change criterion from pre-to-post. 54.29% of SkillJoy users and 60.61% of controls surpassed the reliable change criterion from pre-to-follow-up.

both groups, but no significant difference between groups. However, simple slopes revealed that SkillJoy led to a significant pre-to-follow-up increase of positive emotion of a larger effect size ($d = 0.58$) than the significant increase of ASM ($d = 0.40$).⁴

SBI Savoring the Moment

A significant interaction of pre–post change and condition showed that SkillJoy users increased in savoring to a greater degree than ASM controls (Table 2). There was also a significant pre-to-follow-up difference showing SkillJoy users experienced a greater increase in savoring than ASM controls. Simple slope analyses showed that SkillJoy users significantly increased in savoring from pre- to posttrial and pre-to-follow-up with large effect sizes ($d = 1.22$; $d = 0.70$), but ASM users did not change ($d = 0.24$; $d = -0.04$).⁵

Beck Depression Inventory II

There was a significant decrease in depression symptoms as measured by the BDI-II across both conditions pre- to posttrial with a large effect size (Table 2; $d = -1.60$). Yet there was no significant time by condition interaction effect. Simple slope analyses for pre-to-post were consistent with this result, yet the effect size of SkillJoy ($d = -1.43$) was larger than ASM ($d = -1.12$; Table 3). Pre-to-follow-up simple slopes demonstrated the same pattern with both conditions significantly decreasing in depression, but SkillJoy users had a greater slope ($B = -10.28$ vs. $B = -6.16$) and greater effect size ($d = -1.09$ vs. $d = -0.63$).⁶

Discussion

This study compared an ecological momentary intervention (EMI) for practicing savoring skills to a closely related active self-monitoring (ASM) control in a GAD sample. From pre- to posttrial, seven days of SkillJoy (vs. ASM) use led to significantly greater reductions in worry and greater increases in positive emotions and savoring. In pre- to posttrial simple slope analyses, SkillJoy users significantly changed across all outcome measures, whereas ASM controls did not change in either worry, positive emotions, or savoring. Depression symptoms decreased significantly for both EMIs. In follow-up analyses, SkillJoy users (vs. ASM) exhibited significantly greater increases in savoring, as well as marginally greater decreases in worry with a large effect size ($d = -0.92$). Regarding follow-up simple slope analyses, although Skill-Joy significantly changed in positive emotions and savoring pre-to-follow-up, ASM controls did not change in either savoring or positive emotions. Both EMIs led to decreases in depression at follow-up, yet effect sizes were larger for SkillJoy ($d = -1.09$ vs. $d = -0.63$). Stronger support for SkillJoy pre-to-post than pre-to-follow-up may suggest savoring worked faster than the active control.

There are several reasons SkillJoy may have successfully lessened GAD worry. Worry involves the prediction of improbable negative future outcomes (LaFreniere & Newman,

⁴For the PANAS-X Joviality scale, 47.5% of SkillJoy users and 33.33% of controls surpassed the reliable change criterion from pre-to-post. 71% of SkillJoy users and 39.39% of controls surpassed the reliable change criterion from pre-to-follow-up.

⁵For the SBI Savoring the Moment scale, 32.50% of SkillJoy users and 11.90% of controls surpassed the reliable change criterion from pre-to-post. 35.29% of SkillJoy users and 24.24% of controls surpassed the reliable change criterion from pre-to-follow-up.

⁶For the BDI-II, 52.5% of SkillJoy users and 38.08% of controls surpassed the reliable change criterion from pre-to-post. 67.65% of SkillJoy users and 48.48% of controls surpassed the reliable change criterion from pre-to-follow-up.

2020). SkillJoy encouraged savoring of in-the-moment experiences, good memories, and anticipation of enjoyable upcoming events. This personalized positive data likely conflicted with worry's adverse forecasting. Moreover, attending to pleasant affect may simply be incompatible with worrying and its associated distress. Positive emotions also foster reappraisal of negatively construed events (Fredrickson, 2013), such as those imagined in worry. The "broaden-and-build" effects of positive emotions on cognition may have come into play as well (Fredrickson, 2013), expanding participants' narrowed attention on threat and negative outcomes, freeing up perseveration on worries, and increasing cognitive flexibility. Regardless, having more frequent, intense, and lengthy positive emotions is a beneficial effect in and of itself.

It was proposed that SkillJoy would improve these positive emotions by teaching skills for generating, amplifying, and extending good feelings—savoring. Not surprisingly, enhanced savouring frequency and ability across the trial was one of SkillJoy's clearest effects. Each of SkillJoy's components emphasized savouring in some way—savoring during planned pleasurable activities, in-the-moment when randomly prompted, when reflecting on one's day, and when looking forward to good events. Rather than ruminating or worrying, savoring explicitly guided clients to positively evaluate aspects of their present experience, then dwell on those emotions. Note the control included its own present moment attention elements related to mindfulness and classic cognitive-behavioral therapies. These included purposeful present awareness of thoughts and feelings (e.g., emotion-focused mindfulness; Beblo et al., 2018), as well as related personal reflection, recording, scheduling, and general intentionality toward improving one's mental health. It is possible that active self-monitoring may have had its own beneficial effects—effects beyond placebo or time—accounting for similar levels of change on some measures.

There are several limitations of this study. Regarding generalizability, most participants were White students identifying as women. Although severity was comparable to outpatient samples, our diagnostic process could have been more stringent. We cannot be entirely confident that our sample fully represents GAD. Our interview and questionnaire could not entirely rule out other conditions accounting for participants' endorsement of the GAD criteria. Future trials should include more diverse, psychologist-diagnosed community samples. Another limitation of the study was its brief timeframe (7 days), which was much shorter than cognitive-behavioral therapies common 12 to 20 weeks. Last, our design cannot determine which components contributed most to outcomes.

Our results suggest some preliminary clinical implications. First, therapies that emphasize engagement with *positive* emotions may successfully treat worry. They may also develop greater pleasant affect—a valuable goal unaddressed in most trials. Given the rewarding nature of positive emotions, interventions that target enjoyment may also be particularly self-reinforcing and promote client compliance. Note also that SkillJoy was therapist-independent, potentially making it more accessible and cost-effective than in-person therapy. SkillJoy may also be used in conjunction with traditional therapy, delivered concurrently alongside in-person therapy. In general, psychotherapy may be enhanced by the addition of savoring to existing techniques. The optimal treatment may not only decrease negative

feelings, but increase positive ones as well. SkillJoy may be one successful means to this end, weakening worry *while* strengthening joy.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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All materials can be made available upon reasonable request to the authors.

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What is the public health significance of this article?

This study suggests practicing skills for increasing and sustaining positive emotions may successfully treat worry, generalized anxiety disorder, and symptoms of depression. It may also increase positive emotions and purposeful enjoyment at the same time.

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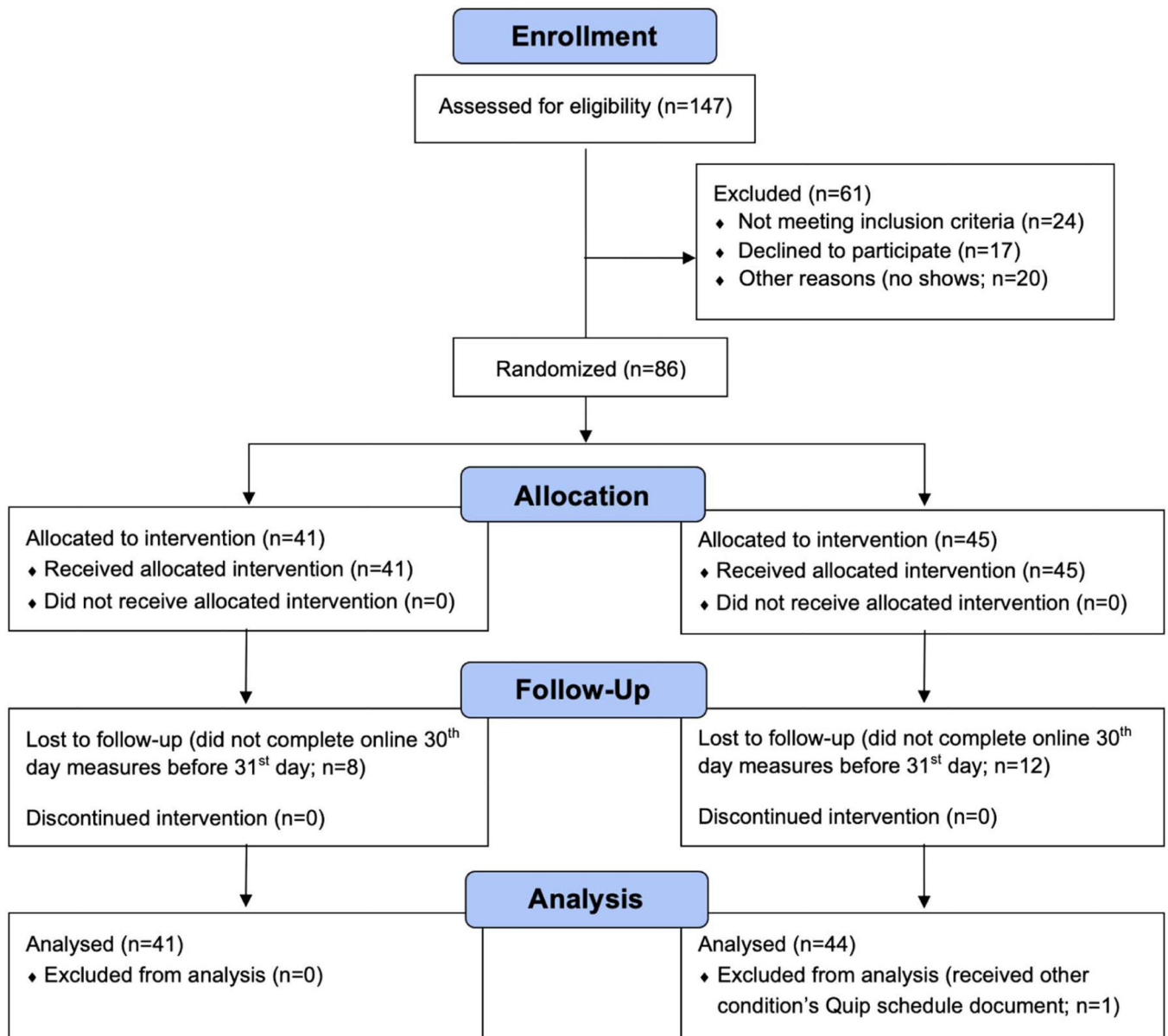


Figure 1.
Consolidated Standards of Reporting Trials Flow Diagram
Note. See the online article for the color version of this figure.

Table 1
Means and Standard Deviations for Outcome Measures at Pretrial, Posttrial, and Follow-Up

| Outcome measure | Pretrial | | Posttrial | | Follow-up | |
|------------------------------|------------------------|--------------------|------------------------|--------------------|------------------------|--------------------|
| | SkillJoy <i>M (SD)</i> | ASMM (<i>SD</i>) | SkillJoy <i>M (SD)</i> | ASMM (<i>SD</i>) | SkillJoy <i>M (SD)</i> | ASMM (<i>SD</i>) |
| PSWQ | 67.44 (6.07) | 66.05 (8.07) | 58.35 (9.80) | 65.02 (8.48) | 58.71 (10.32) | 61.67 (10.42) |
| PANAS-X Joviality | 23.54 (5.15) | 23.36 (6.31) | 27.70 (4.39) | 24.36 (6.10) | 27.03 (6.45) | 25.67 (6.62) |
| SBI Savoring the Moment | 3.91 (1.06) | 4.14 (1.19) | 4.75 (0.85) | 4.30 (1.40) | 4.57 (1.06) | 4.21 (1.18) |
| Beck Depression Inventory II | 26.39 (10.93) | 24.20 (10.66) | 16.60 (12.32) | 16.83 (11.51) | 15.18 (13.71) | 16.56 (15.01) |

Note. ASM = active self-monitoring control; PSWQ = Penn State Worry Questionnaire. PANAS-X = Positive and Negative Affect Schedule-Expanded Form; SBI = Savoring Beliefs Inventory.

Table 2

Linear Mixed Model Results for Pretrial to Posttrial, Posttrial to Follow-Up, and Pretrial to Follow-Up Time Trends, Condition Effects, and Their Interactions

| Outcome measure | Predictor | Pre-to-post | | | | Pre-to-follow-up | | | | Post-to-follow-up | | | |
|------------------------------|------------------|-------------|------|---------|-------|------------------|------|-------------------|-------|-------------------|------|-------------------|-------|
| | | t | SE | p | d | t | SE | p | d | t | SE | p | d |
| PSWQ | Intercept | 66.05 | 1.08 | <.001** | 14.50 | 66.05 | 1.08 | <.001** | 14.50 | 64.53 | 1.41 | <.001** | 14.17 |
| | Time | -1.51 | 1.39 | .275 | -0.33 | -4.28 | 1.78 | .017* | -0.94 | -2.78 | 1.41 | .053 [†] | -0.61 |
| | Condition | 1.39 | 1.56 | .371 | 0.31 | 1.39 | 1.56 | .371 | 0.31 | -6.15 | 2.03 | .002** | -1.35 |
| PANAS-X Joviality | Time × Condition | -7.55 | 1.99 | <.001** | -1.66 | -4.21 | 2.40 | .080 [†] | -0.92 | 3.34 | 1.83 | .068 [†] | 0.73 |
| | Intercept | 23.36 | 0.87 | <.001** | 5.13 | 23.36 | 0.87 | <.001** | 5.13 | 24.41 | 0.79 | <.001** | 5.36 |
| | Time | 1.05 | 0.79 | .253 | 0.23 | 2.16 | 1.06 | .042* | 0.47 | 1.12 | 0.80 | .162 | 0.25 |
| SBI Savoring the Moment | Condition | 0.17 | 1.25 | .890 | 0.04 | 0.17 | 1.17 | .890 | 0.04 | 3.26 | 1.15 | .004** | 0.72 |
| | Time × Condition | 3.08 | 1.14 | .007** | 0.68 | 0.94 | 1.52 | .537 | 0.21 | -2.15 | 1.13 | .058 [†] | -0.47 |
| | Intercept | 4.14 | 0.17 | <.001** | 0.91 | 4.14 | 0.17 | <.001** | 0.91 | 4.31 | 0.18 | <.001** | 0.95 |
| Beck Depression Inventory II | Time | 0.16 | 0.16 | .271 | 0.04 | -0.35 | 0.18 | .849 | -0.08 | -0.20 | 0.25 | .168 | -0.04 |
| | Condition | -0.23 | 0.25 | .343 | -0.05 | -0.23 | 0.25 | .343 | -0.05 | 0.46 | 0.14 | .071 [†] | 0.10 |
| | Time × Condition | 0.69 | 0.22 | .001** | 0.15 | 0.66 | 0.26 | .009** | 0.15 | -0.03 | 0.20 | .886 | -0.01 |
| Beck Depression Inventory II | Intercept | 24.20 | 1.63 | <.001** | 5.31 | 24.20 | 1.63 | <.001** | 5.31 | 16.92 | 1.83 | <.001** | 3.71 |
| | Time | -7.28 | 1.42 | <.001** | -1.60 | -6.16 | 1.93 | .002** | -1.35 | 1.12 | 1.46 | .443 | 0.25 |
| | Condition | 2.19 | 2.34 | .351 | 0.48 | 2.19 | 2.34 | .351 | 0.11 | -0.08 | 2.63 | .976 | -0.02 |
| Beck Depression Inventory II | Time × Condition | -2.26 | 2.03 | .264 | -0.5 | -4.12 | 2.66 | .122 | -0.90 | -1.86 | 1.98 | .349 | -0.41 |

Note. PSWQ = Penn State Worry Questionnaire; PANAS-X = Positive and Negative Affect Schedule-Expanded Form; SBI = Savoring Beliefs Inventory; SE = standard error.

[†]Marginally significant at $\alpha = .10$.

* Significant at $\alpha = .05$.

** Significant at $\alpha = .01$.

Table 3
Simple Slope Analyses of Linear Mixed Model Fixed Effects Results for Time Trends Predicting Outcome Measures by Condition

| Outcome measure | Condition | Pre-to-post | | | Pre-to-follow-up | | | | |
|------------------------------|-----------|-------------|----------|----------|------------------|--------|----------|-------------------|----------|
| | | Slope | <i>t</i> | <i>p</i> | <i>d</i> | Slope | <i>t</i> | <i>p</i> | <i>d</i> |
| PSWQ | SkillJoy | -9.06 | -6.31 | <.001** | -1.39 | -8.49 | -4.65 | <.001** | -1.02 |
| | Control | -1.51 | -1.08 | .283 | -0.24 | -4.28 | -2.30 | .024* | -0.51 |
| PANAS-X Joviality | SkillJoy | 4.13 | 5.24 | <.001** | 1.15 | 3.10 | 2.66 | .009** | 0.58 |
| | Control | 1.05 | 1.30 | .199 | 0.29 | 2.164 | 1.83 | .072 [†] | 0.40 |
| SBI Savoring the Moment | SkillJoy | 0.86 | 5.56 | <.001** | 1.22 | 0.63 | 3.20 | .002** | 0.70 |
| | Control | 0.17 | 1.10 | .276 | 0.24 | -0.04 | -0.18 | .861 | -0.04 |
| Beck Depression Inventory II | SkillJoy | -9.55 | -6.52 | <.001** | -1.43 | -10.28 | -4.95 | <.001** | -1.09 |
| | Control | -7.28 | -5.10 | <.001** | -1.12 | -6.16 | -2.88 | .005** | -0.63 |

Note. Slope coefficients are unstandardized; PSWQ = Penn State Worry Questionnaire; PANAS-X = Positive and Negative Affect Schedule-Expanded Form; SBI = Savoring Beliefs Inventory.

[†]Marginally significant at $\alpha = .10$.

* Significant at $\alpha = .05$.

** Significant at $\alpha = .01$.