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Gratitude Training for Promoting Subjective Well-Being: A Randomized Controlled Trial Comparing Journaling to a Personalized Menu Approach

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Gratitude Training for Promoting Subjective Well-Being: A Randomized Controlled Trial

Comparing Journaling to a Personalized Menu Approach

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ABSTRACT

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Research suggests a link between gratitude and subjective well-being exists. Research on gratitude practices have shown to increase gratitude, subjective well-being, and other related outcomes. However, the efficacy of gratitude practices may be limited by the rote application of the gold standard gratitude practice – the gratitude journal. Such findings suggest that a more comprehensive, adaptable, and flexible gratitude practice may be needed. This study examined the efficacy of the My Best Self 101 (MBS101) gratitude module: an online gratitude resource that provides psychoeducation about gratitude along with a menu of empirically based gratitude practices. Using a randomized controlled design method, this study compared using the MBS101 gratitude module to using a gratitude journal for 21 days. The sample consisted of 225 adults recruited online and through university research systems. Seemingly unrelated regression models were used to analyze gratitude and subjective well-being outcomes between groups as well as the interaction between time spent on gratitude practice and group assignment. Compared to the gratitude journaling group, the MBS101 group had significantly better outcomes on gratitude and subjective well-being. Additionally, when the time and group interaction was added, the MBS101 group had greater increases in benefits for gratitude and subjective well-being with increased time spent. Further research is required to support these findings.

Keywords: gratitude, subjective well-being, online intervention, life satisfaction, modular

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Gratitude Training for Promoting Subjective Well-Being: A Randomized Controlled Trial Comparing Journaling to a Personalized Menu Approach

Working to improve gratitude is a practice that many people worldwide have found to be meaningful and important. Important empirical findings so far have found a link wherein increasing gratitude may increase subjective well-being (Azad Marzabadi et al., 2021; Dickens, 2017; Emmons & McCullough, 2003b; Portocarrero et al., 2020). However, such findings have received fair criticism due to questions about effect sizes, comparison groups, and clinical usefulness (Cregg & Cheavens, 2021). In response to this, some have suggested part of gratitude's limited effectiveness is due mainly to the over-application of one main gratitude intervention – gratitude journaling (Davis et al., 2016). Findings such as these have led to a call for more broad, flexible, and personalized gratitude interventions. In response, the primary purpose of the present study was to examine the potential benefits of a combined psychoeducational and menu-based gratitude training intervention relative to a traditional gratitude journaling practice.

Gratitude and Well-Being

The practice of gratitude (defined as positively recognizing the external contribution of others in the positive, fortunate and/or good experiences in one's own life; Cregg & Cheavens, 2021; Davis et al., 2016; Emmons & McCullough, 2003b) gains weight and importance by its relation to subjective well-being (defined according to Seligman's theory that subjective well-being consists of positive emotions, engagement with an individual's environment, meaningful relationships, purpose and meaning; Seligman, 2011). Both a systematic review and a meta-analysis have supported the association between gratitude and many aspects of well-being (Portocarrero et al., 2020; Wood et al., 2010). This association may be stronger for clinical

samples than for non-clinical samples (Portocarrero et al., 2020). Furthermore, gratitude has been shown to correlate with other markers associated with well-being such as such as decreased stress, better mental health, and better sleep outcomes (Azad Marzabadi et al., 2021; Wood et al., 2008). Such evidence provides support to the claim that gratitude matters when considering subjective well-being and leads to the next intuitive step: that increasing one may increase the other.

Empirically testing gratitude practices as a means to increase well-being began when Emmons and Mccullough (2003b) demonstrated that gratitude journaling increased well-being in general student populations (d = .24 - .56) and amongst people experiencing congenital and neuro-muscular diseases (d = .51 - .56). Further research has accumulated providing consistent support that increasing gratitude has been shown to increase subjective well-being with effect sizes ranging from d = .14 - .31 (Davis et al., 2016; Dickens, 2017). Additionally, though most studies have been conducted on general population samples (Cregg & Cheavens, 2021; Davis et al., 2016), limited research suggests gratitude practices have been effective in increasing well-being in clinical populations along with symptoms of depression and anxiety ($\eta^2 = .11$-.17; Kerr et al., 2015; Southwell & Gould, 2017). Thus, practices focused on increasing gratitude can provide gateways into helping individuals achieve a higher sense of well-being.

Current State of Gratitude Practices

The gold standard in gratitude practice is considered to be using a gratitude journal (Davis et al., 2016; Emmons & McCullough, 2003b; Kaczmarek et al., 2015). Typically, this practice consists of a person taking time every day, every other day, or every week to reflect and write down in a personal journal the things they are grateful for. The individual is encouraged to take their time and focus on writing in depth about a few things they are grateful for rather than

quickly writing about as many different things they are grateful for. This practice first began with Emmons & McCullough (2003b) with either daily or weekly gratitude journals. More recent research suggests that frequency matters as writing in a gratitude journal every other day provides better effects than writing every day (Lyubomirsky, 2007). This practice has grown in popularity to the point that it is the most frequently used gratitude practice. In one meta-analysis of 32 different samples, the gratitude journal was used in 20 of the samples while the next closest practice (the gratitude letter) was used in only seven samples. Overall, research thus far has supported this practice as it has shown to increase subjective well-being.

Despite the popularity of the gratitude journal, other less well-known but empirically supported gratitude practices exist. Some such practices involve an individual expressing gratitude by writing a letter (Lyubomirsky, 2007). Further adding to the expression of gratitude, other practices focus on verbally expressing gratitude, whether it be from a pre-written gratitude letter or in smaller, more random expressions (Berger et al., 2019; Lambert et al., 2010). Other interventions take a more reflective approach by using gratitude meditations (Fraser et al., 2022). Additionally, newer gratitude strategies are focused on providing psychoeducation into the benefits of gratitude (Heckendorf et al., 2019; Komase et al., 2021). Although the gratitude journal has been most emphasized in research, other gratitude practices are gaining empirical support.

Limitations of Gratitude Practices

Despite the evidence in support of gratitude practices, recent meta-analyses suggest that gratitude training effectiveness is limited (Cregg & Cheavens, 2021; Davis et al., 2016). Such meta-analyses suggest that current gratitude practices have small effect sizes for depressive symptoms ($g = -0.18$ - -0.20) and non-significant effect sizes for anxiety (Cregg & Cheavens,

2021; Davis et al., 2016). However, it should be noted that these findings came largely from general population samples and may look different with clinical samples. When comparing findings of well-being, although gratitude interventions do well against a measurement only condition (control participants only receive pre- and post-test measures without any gratitude practice; d = .31), the effect size drastically decreases when compared to alternate activities (activities that required the participant to adjust their daily routine but not in a way that mimicked the gratitude practice being studied; d = 0.17) or matched activities (activities that required the participant to adjust their daily routine in a way that matched the active gratitude practice; d = 0.14; Davis et al., 2016). Furthermore, when compared to another psychologically active group (activities that are inferred to increase well-being), the effect size disappears completely (d = -.03; Davis et al., 2016). This evidence suggests that the simple nature of the traditional gratitude interventions may lack the efficacy necessary to provide a unique contribution above and beyond interventions for other constructs or practices that cause the participant thoughtful introspection. These small effect sizes across findings of well-being, depression, and anxiety – varying widely depending on control group type – have caused researchers to suggest that conclusions about the effectiveness of gratitude interventions are premature (Cregg & Cheavens, 2021; Davis et al., 2016; Wood et al., 2010).

Despite the large number of studies of gratitude interventions to warrant several different meta-analyses (Cregg & Cheavens, 2021; Davis et al., 2016; Dickens, 2017), most gratitude intervention studies use some variation of the original gratitude journal (Boggiss et al., 2020; Wood et al., 2010). In their meta-analysis, Davis et al. noted that, of all the studies included, only one intervention involved psychoeducation (2016). This is problematic, considering the larger body of evidence suggesting other empirically supported gratitude practices exist (Boehm et al.,

2011; Fraser et al., 2022; Komase et al., 2021; Lambert et al., 2010). Additionally, these strategies are often used in isolation, giving the participants only one of many skills to increase their gratitude (Cregg & Cheavens, 2021; Davis et al., 2016). For this reason, there is a need for more intensive and personalized gratitude training that uses a variety of strategies to increase positive outcomes.

Personalization

The solution to this problem may lie outside of gratitude research in the realm of psychotherapy. Some researchers have suggested taking a modular approach to therapy- wherein the therapist chooses from a menu of therapeutic approaches designed to fit the client's individual needs (Fisher et al., 2019; Stumpp & Sauer-Zavala, 2022; Weisz et al., 2012). Rather than taking a fixed manual approach where the clinician uses specific strategies in a linear sequence, this approach allows a clinician to adapt and personalize therapy to create a more optimal treatment for the client (Fisher et al., 2019; Weisz et al., 2012). Such an approach has shown promise as it has led to better outcomes for treatment in a variety of outcomes such as depression, anxiety, and irritability than standard manual treatment (Evans et al., 2020; Fisher et al., 2019; Stumpp & Sauer-Zavala, 2022; Weisz et al., 2012). A more flexible, varied, menu-based training could be a valuable approach to gratitude practices, as the psychotherapy literature provides evidence to support the notion that treatments and resources should be comprehensive while also adaptable to the needs of the individual.

Indeed, part of the challenge in gratitude practices may be that they become too rote to be effective. As evidence of this, the more frequently throughout the week one writes in a gratitude journal, the less gain they get from the practice (Lyubomirsky et al., 2005). Furthermore, many of the gratitude journaling studies included in meta-analysis with smaller effect sizes consisted of

daily journaling (Cregg & Cheavens, 2021; Davis et al., 2016). Such routine practice of the same activity may cause it to feel more like a daily chore than a chance to reflect on things to be grateful for. It is reasons such as this that researchers such as Davis et al., (2016) have called for gratitude practices that require more information and practice for the participant. By providing a broader set of gratitude resources and practices, the practice of gratitude stays fresh, exciting, and more generalizable to the individual and their unique circumstances.

In light of these issues, the My Best Self 101 (MBS101) gratitude module (My Best Self 101, n.d.) was developed as a psychoeducational resource and structured gratitude training that is part of a broader website offering resources and skills training on various positive psychology strategies (www.mybestself101.org; My Best Self 101, n.d.). Consistent with the need for more comprehensive and adaptable gratitude approaches, the MBS101 gratitude module offers engaging psychoeducational resources and a "menu" of evidence-based gratitude practices to help participants experiment with various exercises and cultivate gratitude as a "habit of awareness." Module participants are encouraged to spend 20-30 minutes each day studying the content and experimenting with the exercises over a 3-week period, working their way through the menu of evidence-based gratitude exercises and eventually identifying and emphasizing a smaller set of practices from the menu that feel particularly beneficial.

Study Aims

To test the effectiveness of the MBS101 gratitude module, the proposed study implemented a randomized control trial method to support three aims. The first aim of this study was to examine the effectiveness of the MBS101 gratitude module by showing that individuals who received the MBS101 gratitude module increased in gratitude and well-being from the beginning of training to the end of training. This aim provides a foundation to support the theory

that a comprehensive and flexible approach helps individuals improve. If we do not first establish that this gratitude training resource helps people improve from pre- to post-implementation, there is no need to compare it to other gratitude practices. We hypothesized that the MBS101 gratitude module intervention group would increase in levels of subjective well-being and gratitude from pre- to post-intervention.

Secondly, this study aimed to examine if online gratitude interventions with broader content demonstrated better outcomes than the current gold-standard gratitude training practice. This was best demonstrated by comparing the MBS101 gratitude module to the most popular traditional gratitude intervention – the gratitude journal. In this attempt, we sought to avoid the pitfalls of previous gratitude instruction studies where the effectiveness of the training is primarily due to having a waitlist control group. We hypothesized that the MBS101 group would demonstrate better outcomes than the gratitude journaling group in measures of subjective well-being and gratitude.

Finally, if personalization and adaptation are key aspects of an effective gratitude practice, as we have hypothesized, than it stood to reason that part of that adaptive process is the time spent on the gratitude practice. This study aimed to examine whether individuals who devote more time to practicing gratitude within the MBS101 gratitude module would experience increased gratitude and subjective well-being beyond the gains of those in the journaling group. We hypothesized that as time spent on the MBS101 module increased, the distance between the gains of gratitude and subjective well-being by group would increase. This implied that practice time and group assignment would present an interaction in support of increased gains for the MBS101 group.

Method

Preregistration

This study has been preregistered on the Open Science Framework prior to any data collection. Information on predetermined sample size, measurement, hypotheses, and analyses can be found on our registration (https://osf.io/stkd5). Our deidentified dataset containing all variables used in the study and our Stata do file are attached in the document.

Participants

Participants were recruited through online advertising as well as through the research participation system (in which students are awarded class credit for participating in research) in the Psychology Department of a university in the Intermountain West. Recruitment occurred from September 2022 to November 2022. Online advertisements were posted on multiple social media platforms including Facebook, Twitter, and email newsletters. Additionally, snowball sampling was used where those who saw the flyer on social media were encouraged to share it on their accounts. To qualify for the study, participants were required to be over 18 years of age, native English speakers, have an email account, and have daily access to the internet. Additionally, participants were asked to describe a few details about themselves as well as how they heard about the study to filter out any bots. As means of compensation, participants were offered a $30 Amazon gift card for completing the pre-test survey, participating in gratitude practice, and completing the post-test survey.

A total of 508 people contacted researchers requesting to be included in the study. Participants were then sent a screener survey and, if qualified based on the inclusion criteria mentioned above, were instructed to contact the researchers again. A total of 304 potential participants contacted the researchers at the completion of the screener survey. Of those who

were sent the pre-test survey, 291 participants completed the survey and began participation in the study. Of those who completed the pre-test, 252 completed the post-test survey and were included in the analysis. Of those who were included in the data analysis, 135 were in the journaling group, and 117 were in the MBS101 group. Attrition was 13%. Those who did not complete both the pre-test and post-test survey were not included in the analysis. The average age of participants was 24.22 (SD = 9.62), with a range of 18 to 65 years of age. A total of 56 participants were male, 194 were female, and two chose not to identify their sex. When identifying race, participants were allowed to select all that applied. The majority number of 225 selected white, 10 selected Hispanic/Latina/Latina, nine selected Black/African American, two selected Native American/American Indian/Alaska Native, nine selected Asian, one selected Native Hawaiian/Pacific Islander, and two preferred not to answer. Considering region of the US, 194 lived in the west, 32 lived in the Midwest, 14 lived in the south, 11 lived in the Northeast, and one lived in Alaska. Of furthest level education participants had completed, 39 graduated high school, 159 completed some college, 31 had bachelor's degrees, nine had completed some graduate school, 12 had a graduate degree, and two had completed trade school. A total of 181 participants were single (never married), 66 were married, two were in a domestic partnership, two were divorced, and one was widowed. Religious status of participants consisted of 243 Christians, six with no religious affiliation, two who preferred not to say, and one who identified as spiritual. Of those in the study, 99 participants were students recruited through the research participation system, and 153 were recruited from the broader online sampling methods. There were no statistically significant differences in any demographic between the MBS101 and the journaling group (see Table 1).

Table 1

Demographics by Gratitude Training Group

Variable	Total Sample	MBS101 Group		Journaling Group	
		M (SD)	Count (%)	M (SD)	Count (%)
Age	24.22(9.64)	23.54 (9.95)		24.(81)	
Sex					
Male	56 (22.22)		20 (7.94)		36 (14.29)
Female	194 (76.98)		96 (38.1)		98 (38.89)
Prefer not to Answer	2 (0.79)		1 (0.4)		1 (0.4)
Race					
White	235 (93.25)		108 (42.86)		127 (50.4)
Hispanic/Latinx	10 (3.97)		4 (1.59)		6 (2.38)
Black/African American	9 (3.57)		5 (1.98)		4 (1.59)
Native American/American Indian/ Alaska Native	2 (0.79)		2 (0.79)		0 (0)
Asian	9 (3.57)		5 (1.98)		1 (0.4)
Other	1 (0.4)		1 (0.4)		0 (0)
Prefer not to answer	2 (0.79)		0 (0)		2 (0.79)
Region					
West	194 (76.98)		86 (34.13)		108 (42.86)
Midwest	32 (12.7)		18 (7.14)		14 (5.56)
South	14 (5.56)		8 (3.17)		6 (2.38)
Northeast	11 (4.37)		5 (1.98)		6 (2.38)
Alaska	1 (0.4)		0 (0)		1 (0.4)
Education Level					
High School	39 (15.48)		21 (8.33)		18 (7.14)
Some College	159 (63.1)		70 (27.78)		89 (35.32)
Bachelor's Degree	31 (12.3)		15 (5.95)		16 (6.35)
Some Graduate School	9 (3.57)		4 (1.59)		5 (1.98)
Graduate Degree	12 (4.76)		6 (2.38)		6 (2.38)
Trade School	2 (0.79)		1 (0.4)		1 (0.4)
Marital Status					
Single (Never Married)	181 (71.83)		81 (32.14)		100 (39.69)
Married	66 (26.19)		35 (13.89)		31 (12.3)
Domestic Partnership	2 (0.79)		0 (0)		2 (0.79)
Divorced	2 (0.79)		1 (0.4)		1 (0.4)
Widowed	1 (0.4)		0 (0)		1 (0.4)
Religion					
Christianity	243 (96.43)		114 (45.24)		129 (51.19)
Judaism	6 (2.38)		2 (0.79)		4 (1.59)
Spiritual	1 (0.4)		1 (0.4)		0 (0)
Prefer not to say	2 (0.79)		0 (0)		2 (0.79)
Recruitment					
Student Credit	99 (39.29)		42 (16.67)		57 (22.61)
General Sampling	153 (60.71)		75 (29.76)		77 (30.56)

Procedures

Study social media flyers included an email address that interested individuals were to contact to inquire about participation. Upon sending an email, potential participants were then provided with a Qualtrics survey link containing an electronic survey and screener questions to determine if they qualified for participation. Potential participants who did not qualify for the study were sent to the end of the Qualtrics survey and notified that they do not qualify. At the end of the survey, potential participants who qualified were given a randomly generated ID number. We assigned those who were given an even-numbered ID number to the MBS101 group, and those given an odd-numbered ID number to the journaling group. At the completion of the screener survey participants were instructed to email the researchers again with their ID number and desired start date. On the selected start date, participants were sent a pre-test survey, instructions for their assigned gratitude training group, and a spreadsheet to record their gratitude practice. Participants were instructed to take the pre-test prior to their interaction with their gratitude practice. At the end of the third week, both groups were emailed a post-test survey. Participants who completed the pre-test survey, recorded any amount of participation in their spreadsheet, and completed the post- test were awarded a $30 Amazon gift card.

Gratitude Training

Participants in the MBS101 group were provided with a link to the gratitude module website (https://www.mybestself101.org/gratitude) and were instructed to interact with the module for 20 minutes each day for 21 days. Participants were encouraged to take the first week spending the majority of their daily 20 minutes learning about gratitude by reading the psychoeducational material included on the website. For the second and third weeks, participants were encouraged to spend the majority of their 20 daily minutes engaging with the gratitude

practices provided on the website. MBS101 group participants were also asked to report in the spreadsheet the amount of time they spent studying gratitude in the module and the amount of time they spent practicing gratitude with the suggested strategies in the module.

The MBS101 Gratitude module contains both empirically supported psychoeducational content and empirically supported practices directed towards developing gratitude. All material in the module was based on current empirical literature. The gratitude strategies menu included 9 different suggested gratitude strategies. The first was keeping a gratitude journal. Though this was the strategy that was practiced by the journaling group, it is an empirically supported strategy and is thus included as one of many gratitude strategies included in the menu. The second strategy was writing a gratitude letter where participants are encouraged to take 10 – 20 minutes a day once a week to write a gratitude letter to someone they are grateful for. The third strategy was a 15-minute video of a guided gratitude meditation. The fourth strategy asked participants to set their smartphone to give them 2 – 3 reminders throughout the day to reflect on what they are grateful for. Participants were encouraged to make these reminders random, if possible. The fifth strategy involved participants looking throughout the day for informal opportunities for gratitude where they followed through with their own ideas to express gratitude. The sixth strategy consisted of four writing prompts relating to gratitude. The seventh strategy was an adaptation of John Gottman's "I appreciate…." exercise (2000) where participants were instructed to express gratitude to anyone they wish (instead of just a spouse, as outlined by Gottman). The eighth strategy was a negative visualization (or mental subtraction) exercise in which participants were instructed to visualize their life without something or someone they appreciate. Finally, the ninth strategy encouraged participants to try the Gratitude Journal 365 app, which included practices that combined many of the aforementioned strategies

(*Gratitude 365 Journal - Self Care*, 2022) The strategies menu can be found at https://www.mybestself101.org/gratitude-strategies

Participants in the journaling group were instructed to take time every other day for 21 days to write about 3 things they were grateful for in a private place that they were not required to share with us. Journaling group participants were instructed to report the amount of time they spent journaling and how many things they journaled about in the spreadsheet.

At the end of the first and second weeks, participants were sent an accountability survey where they were reminded of their gratitude practice instructions, reminded to update their spreadsheet, and answer questions about how their gratitude practice went the previous week.

Measures

This study examined the effects of gratitude training on self-reported gratitude skills and subjective well-being. Gratitude was measured with our own developed gratitude measure – the My Best Self 101 Gratitude Questionnaire (MBS Gratitude), the gratitude questionnaire-6 (McCullough et al., 2002), the Gratitude Adjectives Checklist (Emmons & McCullough, 2003a), and the Gratitude Resentment and Appreciation Test – Short Form (Watkins et al., 2003).

My Best Self 101 Gratitude Questionnaire (MBS Gratitude Measure)

This recently created gratitude measure was developed as a gratitude measure designed to be sensitive to change. Items in the MBS gratitude measure were developed to represent the breadth of the construct of gratitude within the broader literature while allowing for sensitivity to change. Some items were adapted from existing gratitude measures such as the GQ6 (McCullough et al., 2002) while others were created written particularly for this measure. The MBS gratitude measure is a 9-item self-report measure rated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The scale is scored by summing item responses.

Preliminary findings from this study provide initial reliability and validity evidence for this measure. In the current study, internal consistency was good for pre-test ratings (α = .80) and acceptable (α = .78) for post-test ratings. Additionally, 30 out 36 inter-item Pearson bivariate correlations were significant ($p < .05$) at pre-test and 33 of 36 correlations were significant at post-test. A factor analysis revealed a one-factor structure at pre- and post-test (Eigenvalue = 2.84; Eigenvalue = 2.75) that accounted for 94.68% and 94.39% respectively of the variance within the measure. On the pre-test the MBS gratitude measure correlated significantly with the GQ6 (r = .76), the GAC (r = .60), and the GRAT-Short Form (.64). Identical to the pre-test, on the post-test the MBS gratitude measure correlated significantly with the GQ6 (r = .65), the GAC (r = .58), and the GRAT-Short Form (r = .64).

Gratitude Questionarrie-6 (GQ6)

The GQ6 is a six item self-report scale designed to measure gratitude (McCullough et al., 2002). The GQ6 is considered to be the most commonly used measure for gratitude (Portocarrero et al., 2020). The GQQ has previously demonstrated good internal consistency (α = .82), with a one-factor structure. The GQ6 is scored by reverse-scoring negatively worded items and summing the individual items. In the current study, the GQ6 demonstrated acceptable internal consistency for pre- (α = .77) and post-test scores (α = .71). On both pre- and post-test measures, all inter-item Pearson bivariate correlations were significant ($p < .05$), and the GQ6 displayed a one factor structure (Pre: Eigenvalue = 2.20; Post: Eigenvalue = 1.77).

Gratitude Adjectives Checklist (GAC)

The GAC is a widely used, brief scale measuring gratitude. Individual are asked to rate 3 items (thankful, appreciative, and grateful) on a 5-point scale (1 = not at all, 5 = extremely) how much they experienced feeling that emotion in the last week. Internal consistency estimates from

previous studies ranged from .86 - .92, suggesting good internal consistency. In the current study, internal consistency for the GAC was acceptable at pre- (α = .77) and post-test (α = .78). All three inter-item Pearson bivariate correlations were significant at pre- and post-test ($p < .05$). The GAC demonstrated a one-factor structure and pre- (Eigenvalue = 1.44) and post-test (Eigenvalue = 1.51).

Gratitude, Resentment, and Appreciation Test (GRAT) - Short Form

The GRAT-Short Form is a commonly used scale that provides scores for overall gratitude, sense of abundance (Ab), simple appreciation (SA), and appreciation for others (AO). Uses of confirmatory factor analysis have confirmed this three-factor structure (Froh et al., 2011). The measure displayed good reliability (alpha = .92) with each separate factor displaying at-least adequate levels of internal consistency (Ab = .88, SA = .90, AO = .76). The scale also demonstrated good test-retest reliability (r = .90). The GRAT also demonstrated predictive validity for positive affect (Froh et al., 2011). The GRAT-Short Form can either be used as a summative score or it can be scored by its three separate sub-scales. For the purposes of this study, we used the overall summative score. In the current study, the GRAT-Short Form demonstrated good internal consistency at pre- (α = .85) and post-test (α = .84). At pre-test and post-test, the measure demonstrated 107 of 120 significant inter-item Pearson bivariate correlations ($p < .05$). The measure demonstrated a two-factor structure at pre- (Eigenvalues = 4.46, 1.71) and post-test (Eigenvalues = 4.37, 1.59).

Survey on Flourishing (SURF)

The SURF is a recently developed, 13-item, self-report measure designed to measure subjective well-being. Preliminary evidence shows that the measure has good internal consistency (α = .95) and converges with other measures of subjective well-being (Linford,

2020). In the current study, the SURF demonstrated high internal consistency at pre- (α = .91) and post-test (α = .93). At both pre- and post-test, the SURF had 91 of 91 significant inter-item Pearson bivariate correlations ($p < .05$). The SURF demonstrated a robust one-factor structure at pre- (Eigenvalue = 5.88) and post-test (Eigenvalue = 6.48).

Satisfaction with Life Scale (SWLS)

The SWLS is 5-item, self-report measure designed to measure satisfaction with life. It is a brief and widely used scale of subjective well-being. It has demonstrated good internal consistency (α = .87) sufficient criterion validity based on life satisfaction ratings determined based on interviews with the experimenters. SWLS scores were also correlated with other measures of subjective well-being, indicating convergent validity (Diener, 1985). The SWLS is scored by summing all 5 items. In the current study, the SWLS demonstrated good internal consistency at pre- (α = .86) and post-test (α = .88). At both pre- and post-test, the SWLS had 12 of 12 significant inter-item Pearson bivariate correlations ($p < .05$). The SWLS demonstrated a one-factor structure at pre- (Eigenvalue = 2.73) and post-test (Eigenvalue = 2.96).

Positive and Negative Emotion Scale (PANAS)

The PANAS scale measures general mood and subjective well-being. The PANAS consists of two sub-scales: positive affect (PA) and negative affect (NA). Scores are obtained for these subscales by summing all the positive affect items for the positive affect subscale and summing all the negative affect items for the negative affect item subscale. The internal consistency for the negative affect and positive affect subscales range from acceptable to good. PANAS scores indicated convergent validity with measures of depression (BDI), distress/dysfunction (HSCL), and affect measures (A-state) (Watson et al., 1988). In the current study, the PANAS demonstrated a two-factor structure at pre- (Eigenvalues = 4.96, 2.46) and

post-test (Eigenvalues = 5.74, 2.55) with positive and negative affect items loading onto their respective factors. The PA scale demonstrated good internal consistency at pre- (α = .85) and post-test (α = .88). The PA scale had 44 of 45 significant inter-item correlations at pre-test and 45 of 45 significant correlations at post-test ($p < .05$). The NA scale demonstrated good internal consistency at pre- (α = .82) and post-test (α = .85). The NA scale had 44 of 45 significant inter-item correlations at pre-test and 45 of 45 significant correlations at post-test ($p < .05$).

Analyses

Power Analysis

To determine an adequate sample size, we conducted an a priori power analysis. Previous research on traditional gratitude training approaches suggests that effect sizes range anywhere from d = 0.00 - 0.60, depending on the control condition used for the study (Cregg & Cheavens, 2021; Davis et al., 2016). However, given that the current study compares a more comprehensive, flexible gratitude approach to a traditional gratitude approach, these effect sizes are not sufficient alone for conducting a power analysis.

To better understand what effect sizes to expect, we consulted the literature comparing a modular approach to therapy to a fixed method approach using a regimented therapy manual. Studies in this area of research suggest that effect sizes of a modular approach compared to fixed approach range from d = 0.3 to d = 0.8 (Evans et al., 2020; Weisz et al., 2012). In determining what effect size to use for power analysis, we determined that an effect in between the traditional gratitude effects and the modular therapy effects would best encapsulate the expected effect from this study. Thus, we estimated an effect size of 0.40 in conducting the power analysis.

By using the power calculating software of G-Power 2 (Faul et al., 2007, 2009), we conducted an independent group means power analysis with an effect size of d = .4, an alpha

level of .05, and a power level of .80. The power analysis indicated that a sample size of n = 200, with n = 100 per group, would be sufficient for the current study. This benchmark was attained as the final count of participants in the study was 252 with 135 in the journaling group and 117 in the MBS101 group.

Data Analysis

To answer our first research question, as to whether those in the MBS101 group increased in gratitude and subjective well-being from pre- to post-test, we used a paired sample t-test comparing pre-test scores to post-test scores on all measures of gratitude and subjective well-being.

To answer our second research question as to whether the MBS101 gratitude module would demonstrate relatively better outcomes than the traditional gratitude journal, we used a multiple regression. We used separate multiple regression analyses for each gratitude and subjective well-being measure, and included demographic measures age, sex, and race to control for demographic variance within our model. The equations for our models are as follows with "SWB" indicating subjective well-being and "grat" indicating gratitude:

$$post\_test\ SWB_i = b_0 + b_1 pre\_test\ SWB_i + b_2 MBS101\_g_i + b_3 Age_i + b_4 sex\_male_i + b_{4-i} race_i$$

$$post\_test\ grat_i = b_0 + b_1 pre\_test\ grat_i + b_2 MBS101\_g_i + b_3 Age_i + b_4 sex\_male_i + b_{4-i} race_i$$

To save space in the example equations, race variables are coded as $b_{4-i} race_i$. However, each race that was represented in the data was dummy coded and included in our model with the white demographic being used as the base comparison, since it had the largest representation in the current sample. The key part of the model that provided information to answer our research question was the predictor variable of $b_2 MBS101\_g_i$. This part of the model explained whether the assigned gratitude group was a significant predictor and if the MBS101 group demonstrated

larger (or smaller) outcomes then the journaling group. All effect sizes for training outcomes by group were calculated using Cohen's d by estimating post-test scores.

Finally, to answer our third research question as to whether individuals who devote more time to practicing gratitude within the MBS101 module will experience increased gratitude and subjective well-being, we used another multiple regression model including an interaction between time and training group. Given, that those in the journaling group were instructed to journal every other day, and those in the MBS101 group were instructed to practice with gratitude every day, time spent practicing gratitude was measured in a minutes-per-day ratio. This ratio was calculated by taking the overall time an individual spent practicing gratitude over the course of the study and dividing it by the number of days the individual practiced gratitude. Thus, in the model included below, time is represented with MPD signifying minutes per day. The models are as follows:

$$post\_test\ SWB_i = b_0 + b_1 pre\_test\ SWB_i + b_2 MBS101\_g_i + b_3 MPD_i + b_4 MBS101\_g_i x MPD_i + b_4 Age_i + b_5 sex\_male_i + b_{6-i} race_i$$

$$post\_test\ GRAT_i = b_0 + b_1 pre\_test\ GRAT_i + b_2 MBS101\_g_i + b_3 MPD_i + b_4 MBS101\_g_i x MPD_i + b_4 Age_i + b_5 sex\_male_i + b_{6-i} race_i$$

After completing our preregistration and analyzing the data, we determined that using Zellner's (1962) Seemingly Unrelated Regression (SUR) analysis would be an appropriate method to control for multiple comparisons. SUR is a technique that allows for the simultaneous estimation of a system of regression analyses while the error terms across models are assumed to be correlated. This can be particularly useful in situations where multiple outcomes are being measured and there may be interdependence among them – such as was the case of running several different multiple regression analyses on a single participant's scores on different

gratitude and subjective well-being measures. After conducting the SUR analysis, we found that the same beta coefficients remained significant as in our initial analysis. This suggests that our results are robust and that the SUR analysis did not alter the significance of the effects. All analyses were conducted using StataSE 17.

Results

The data were cleaned and prepared prior to conducting any analyses. After summing each pre- and post-test measure to obtain a final score, each scale score distribution, as well as minutes per day ratio, was screened for outliers. We defined outliers in our data as any data point beyond 2 interquartile ranges above or below the mean. We determined defining outliers by median and interquartile ranges would be a more accurate decision than using mean and standard deviation, as the median and interquartile range is less influenced by outlier scores. Any outliers that exceeded the 2 interquartile range were brought to that value. The total amount of outliers – between pre-test scores and post-test scores for each measure – fenced to this range was 86. Since each participant completed all pre-test measures, all post-test measures, and documented their practice time on their spreadsheets, there was no need to estimate missingness.

Hypothesis 1: MBS101 Group Training Outcomes Pre-Test to Post-Test

To test whether the MBS101 Gratitude module increased gratitude from pre-test to post-test a paired t-test was conducted for each measure within the MBS101 group. Participants in the MBS101 group had a significant increase in all measures of gratitude, and subjective well-being and decreases in negative affect. Effect sizes were large for measures of gratitude ($d = 0.97$-1.05), subjective well-being ($d = .76 – 1.14$), and negative affect ($d = 1.09$). All pre-test means, post-test means, standard deviations, t-scores, and effect sizes are reported on Table 2 As was

hypothesized, the MBS101 Gratitude Module led to increases in gratitude and subjective well-being from pre-test to post-test.

Table 2

Pre- to Post-Test Scores of Gratitude and Subjective Well-Being for MBS101 Group

Measure	Pre-Test M(SD)	Post-Test M(SD)	*t* (df)	*d*
MBS Gratitude	48.68(6.29)	54.65(4.71)	11.37*	1.05
GAC	11.37(1.88)	13.27(1.53)	11.02*	1.02
GQ6	34.98(4.26)	38.59(3.12)	10.56*	0.97
GRAT-Short Form	75.25(8.54)	81.71(6.58)	10.92*	1.01
SURF	63.31(11.75)	73.54(10.76)	12.37*	1.14
SWLS	24.95(5.77)	28.50(5.48)	8.71*	0.81
PANAS – PA	33.45(6.31)	37.30(7.00)	8.26*	0.76
PANAS – NA	23.02(6.75)	18.03(5.91)	-11.80*	1.09

* $p < .001$

To provide replication of previous findings of gratitude journaling, we conducted a paired t-test for each measure within the journaling group. Participants in the journaling group had a significant increase in all measures of gratitude, and subjective well-being and decreases in negative affect. Effect sizes ranged from moderate to large for measures of gratitude (d = 0.64 – 0.93), subjective well-being (d = 0.56 – 0.91), and negative affect (d = 0.63). All pre-test means, post-test means, standard deviations, t-scores, and effect sizes are reported on Table 3.

Table 3

Pre- to Post-Test Scores of Gratitude and Subjective Well-Being for Journaling Group

Measure	Pre-Test M(SD)	Post-Test M(SD)	*t* (df)	*d*
MBS Gratitude	49.36(6.50)	53.54(4.85)	10.78*	0.93
GAC	11.58(2.04)	12.93(1.67)	9.37*	0.81
GQ6	35.36(4.26)	37.66(3.26)	7.46*	0.64
GRAT-Short Form	76.37(8.57)	80.80(6.84)	8.65*	0.74
SURF	63.50(13.26)	71.32(11.84)	10.52*	0.91
SWLS	24.92(6.33)	27.68(5.62)	7.97*	0.67
PANAS – PA	34.19(6.43)	36.62(6.37)	6.51*	0.56
PANAS – NA	22.17(6.31)	19.00(5.70)	-7.27*	0.63

* $p < .001$

Hypothesis 2: MBS101 Group Will Demonstrate Better Outcomes than Journal Group

To test whether the assigned gratitude group affected changes in gratitude and subjective well-being we conducted a multiple regression model using the model mentioned above. All measures were standardized to allow for easier interpretation according to standard deviation increases decreases. Findings for each measure of gratitude and subjective well-being are as follows:

Gratitude

A model assessing the MBS Gratitude measure yielded a significant regression equation ($F(11, 240) = 16.89$, $p < .001$), with an R^2 of .43. The group assignment variable was a significant predictor with a beta coefficient of .27 ($p = .005$, 95%CI = [.08, .46]; see Table 4). This can be interpreted to say, when controlling for pre-test scores, age, sex, and race, those in the MBS101 group experienced a .27 standard deviation increase in reported post-test gratitude

above those of the journaling group (see Figure 1). The assigned group yielded a small effect size on post-test MBS Gratitude Scores (d = .23)

Table 4

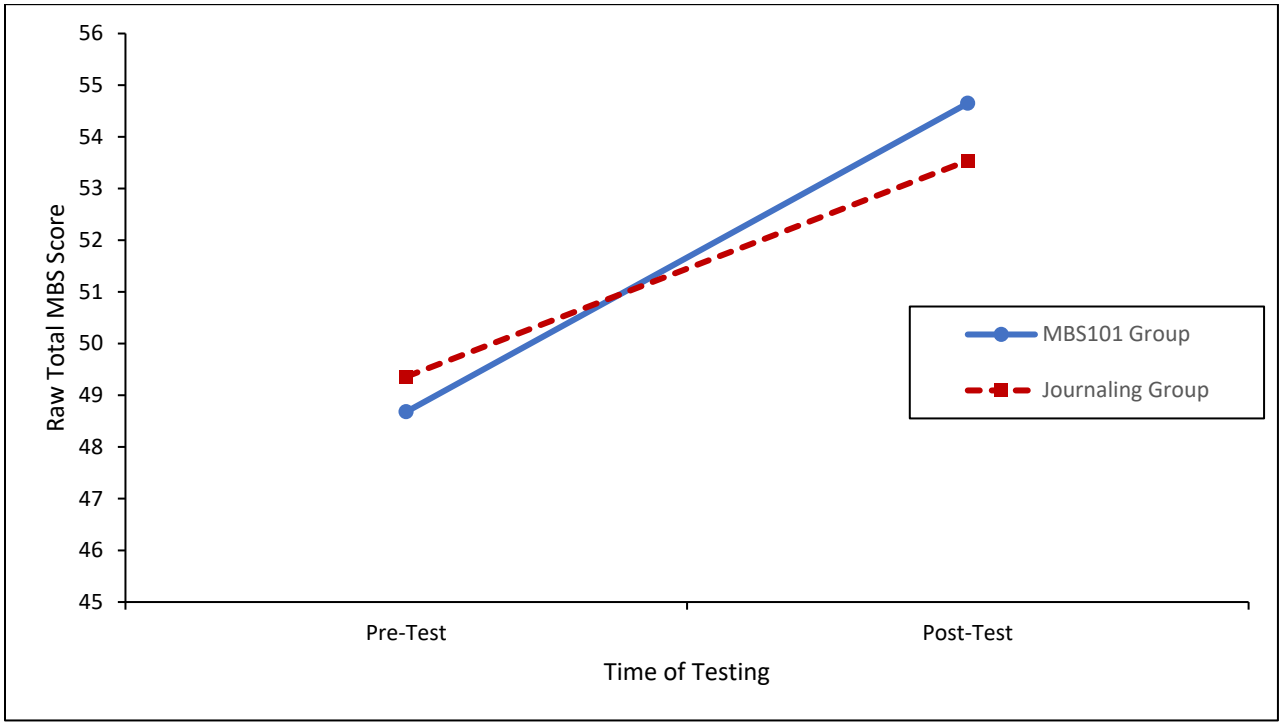
Multiple Regression Coefficients for Predicting Post-Test MBS Gratitude Scores

Variable	β	95% CI	t	p
Constant	-0.48	[-0.80, -0.16]	-2.95	.004
Pre-test MBS Score	0.53	[0.45, 0.61]	12.60	< .001
MBS101 Group	0.27	[0.08, 0.46]	2.79	.005
Age	0.005	[-0.01, 0.01]	0.90	.37
Sex				
Female	0.33	[0.11, 0.56]	2.86	.004
Prefer Not to Answer	-0.41	[-1.50, 0.68]	-0.74	.46
Race				
Hispanic or Latino/Latina	-0.11	[-0.59, 0.37]	-0.46	.65
Black or African American	.35	[-0.15, 0.86]	1.37	.17
Native American/ American Indian or Alaska Native	-0.17	[-1.22, 0.88]	-0.32	.75
Asian	-0.52	[-1.03, -0.002]	-1.97	.05
Native Hawaiian or Pacific Islander	0.30	[-1.17, 1.78]	0.40	.69
Prefer Not to Answer	0.45	[-0.60, 1.50]	0.84	.40

Note: $R^2 = .43$ *(N = 252, p < .001)*

Figure 1

Pre- and Post-Test MBS Gratitude Scores by Group



The model assessing the GAC yielded a significant regression ($F(11, 240) = 9.60$, $p < .001$, $R^2 = .30$) with assigned group as a significant predictor with a coefficient of .26 ($p = .02$, 95%CI = [.05, .47]; see Table 5). Thus, when controlling for pre-test scores, age, sex, and race, those in the MBS101 group experienced a .26 standard deviation increase above those in the journaling group on post-test GAC scores. Effect sizes were small for post-test GAC scores by gratitude group ($d = .21$; see Figure 2)

Table 5

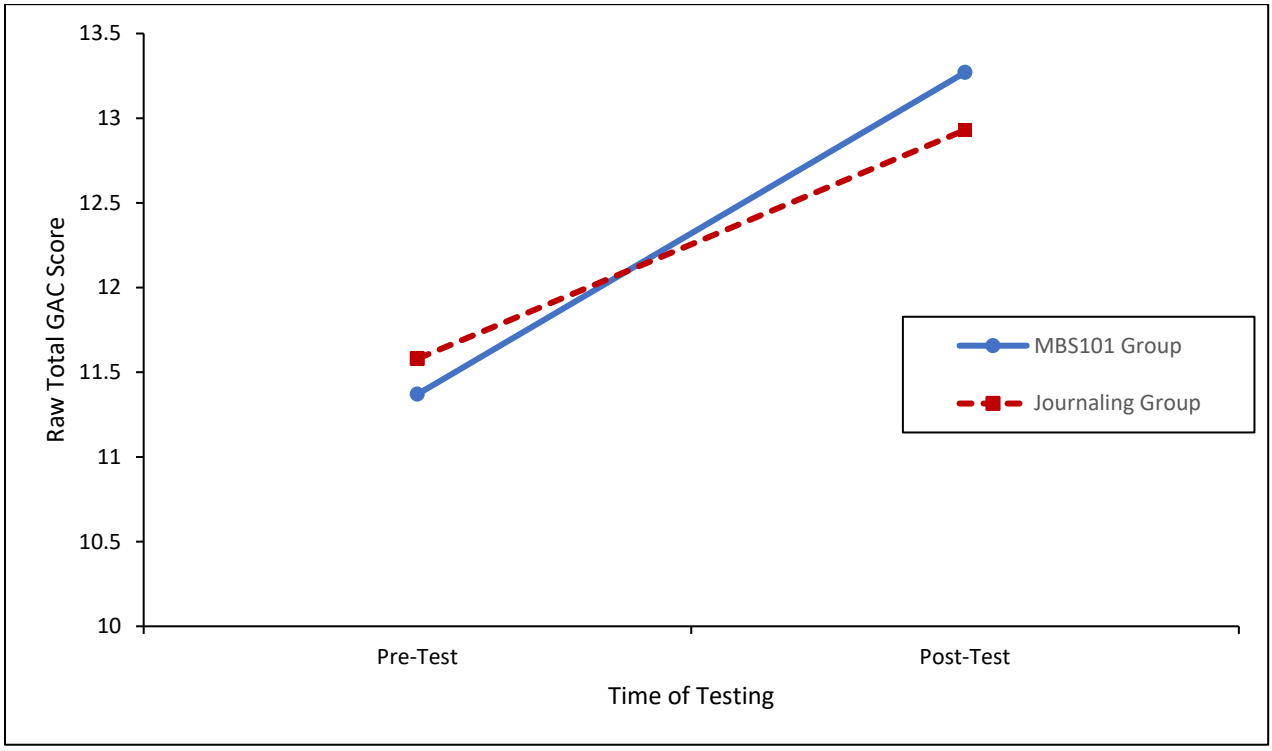
Multiple Regression Coefficients for Predicting Post-Test GAC Gratitude Scores

Variable	β	95% CI	t	p
Constant	-0.24	[-0.47, -0.01]	-2.01	.04
Pre-test GAC Score	0.49	[0.39, 0.58]	10.19	< .001
MBS101 Group	0.26	[0.05, 0.47]	2.38	.02
Age	0.02	[-0.09, 0.12]	0.34	.73
Sex				
Female	0.12	[-0.13, 0.38]	0.94	.35
Prefer Not to Answer	-0.91	[-2.12, 0.30]	-1.48	.14
Race				
Hispanic or Latino/Latina	0.22	[-0.31, 0.76]	0.82	.41
Black or African American	.35	[-0.21, 0.91]	1.21	.23
Native American/American Indian or Alaska Native	0.49	[-0.68, 1.66]	0.83	.41
Asian	0.20	[-0.37, 0.77]	0.69	.49
Native Hawaiian or Pacific Islander	-0.70	[-2.33, 0.94]	-0.83	.41
Prefer Not to Answer	0.55	[-0.61, 1.72]	0.93	.36

Note: $R^2 = .30$ *(N = 252, p < .001)*

Figure 2

Pre- and Post-Test GAC Gratitude Scores by Group



The model assessing the GQ6 yielded a significant regression ($F(11, 240) = 13.30$, $p < .001$, $R^2 = .37$) with the MBS101 group as a significant predictor with a coefficient of .32 ($p < .01$, 95%CI = [.12, .51]; see Table 6). When controlling for pre-test scores, age, sex, and race, those in the MBS101 group experienced a .32 standard deviation increase above those in the journalling group on post-test GQ6 scores. Effect sizes were small for post-test GQ6 scores by assigned group ($d = .29$) .

Table 6

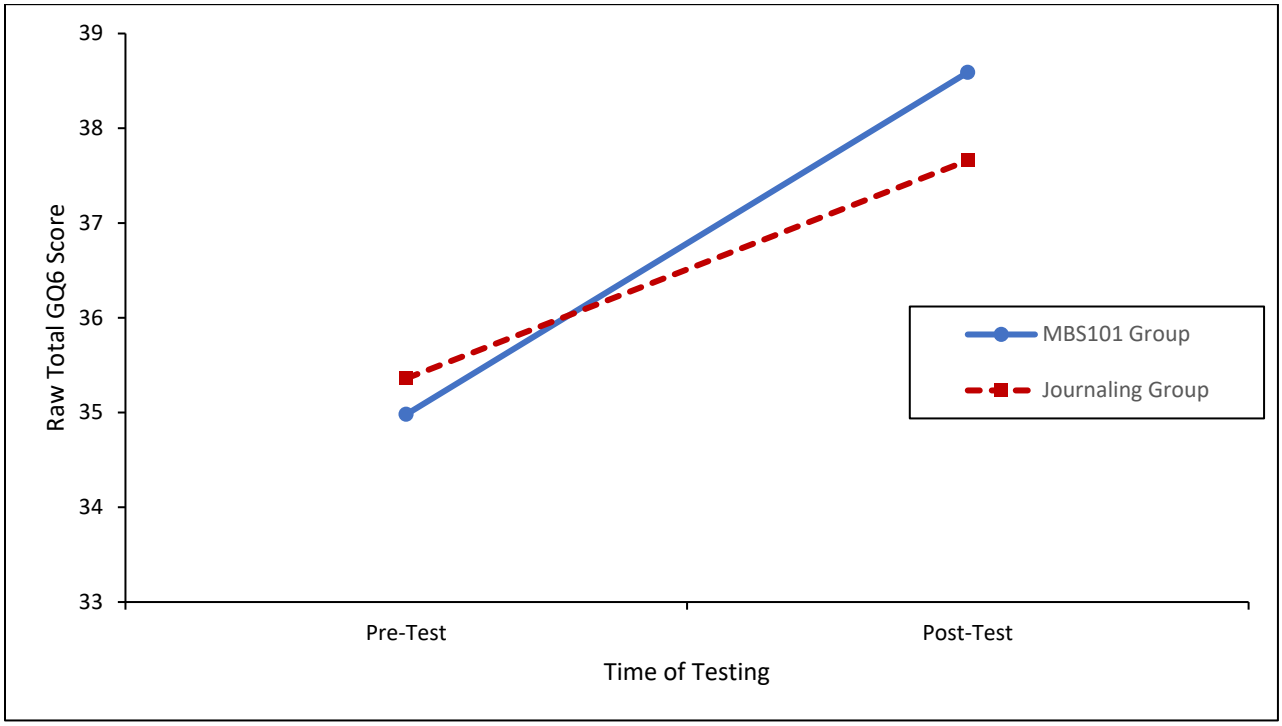
Multiple Regression Coefficients for Predicting Post-Test GQ6 Gratitude Scores

Variable	β	95% CI	t	p
Constant	-0.46	[-0.68, -0.24]	-4.11	<.001
Pre-test GQ6 Score	0.46	[0.37, 0.55]	10.19	< .001
MBS101 Group	0.32	[0.12, 0.51]	3.11	.002
Age	0.06	[-0.04, 0.17]	1.20	.23
Sex				
Female	0.40	[0.16, 0.64]	3.27	.001
Prefer Not to Answer	-0.63	[-1.78, 0.51]	-1.08	.28
Race				
Hispanic or Latino/Latina	0.08	[-0.50, 0.51]	0.03	.98
Black or African American	-0.07	[-0.60, 0.46]	-0.26	.79
Native American/ American Indian or Alaska Native	0.09	[-1.01, 1.19]	0.16	.87
Asian	-0.004	[-0.54, 0.54]	-0.01	.99
Native Hawaiian or Pacific Islander	0.67	[-0.88, 2.22]	0.85	.40
Prefer Not to Answer	1.41	[0.31, 2.51]	2.50	.01

Note: $R^2 = .37$ *(N = 252, p < .001)*

Figure 3

Pre- and Post-Test GQ6 Gratitude Scores by Group



The model assessing the GRAT-Short Form yielded a significant regression ($F(11, 240) = 24.01$, $p < .001$, $R^2 = .52$) with the MBS101 group as a significant predictor with a coefficient of .21 ($p = .02$, 95%CI = [.04, .39]; see Table 7). When controlling for pre-test scores, age, sex, and race, those in the treatment group experienced a .21 standard deviation above those in the journalling group on post-test GRAT-Short Form scores. Effect sizes were small for post-test GRAT-Short Form scores by assigned group ($d = .14$; see Figure 4).

Table 7

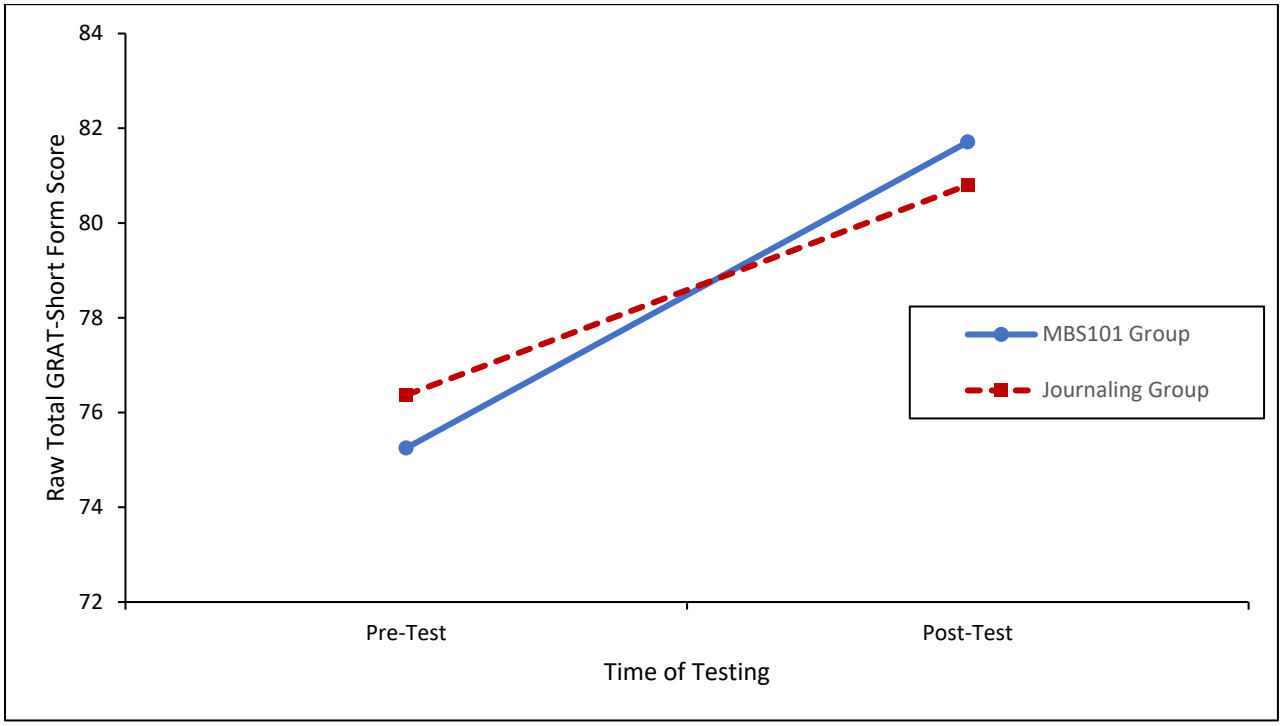
Multiple Regression Coefficients for Predicting Post-Test GRAT-Short Form Gratitude Scores

Variable	β	95% CI	t	p
Constant	-0.35	[-0.54, -0.16]	-3.54	< .001
Pre-test GRAT-Short Form Score	0.57	[0.49, 0.65]	14.26	< .001
MBS101 Group	0.21	[0.04, 0.39]	2.38	.02
Age	0.04	[-0.04, 0.13]	0.95	.34
Sex				
Female	0.34	[0.13, 0.55]	3.16	.002
Prefer Not to Answer	0.20	[-0.79, 1.20]	0.40	.68
Race				
Hispanic or Latino/Latina	0.17	[-0.27, 0.61]	0.75	.45
Black or African American	-0.52	[-0.98, -0.05]	-2.16	.03
Native American/ American Indian or Alaska Native	-0.36	[-1.33, 0.60]	-0.73	.46
Asian	-0.20	[-0.67, 0.28]	-0.82	.41
Native Hawaiian or Pacific Islander	0.30	[-1.06, 1.66]	0.43	.67
Prefer Not to Answer	0.96	[-0.001, 1.93]	1.96	.05

Note: $R^2 = .52$ *(N = 252, p < .001)*

Figure 4

Pre- and Post-Test GRAT-Short Form Gratitude Scores by Group



Subjective Well-Being

The model assessing the SURF yielded a significant regression ($F(11, 240) = 28.01$, $p < .001$, $R^2 = .56$) with the MBS101 group as a significant predictor with a coefficient of .18 ($p = .03$, 95%CI = [.02, .35]; see Table 8). Thus, when controlling for pre-test scores, age, sex, and race, those in the treatment group experienced a .18 standard deviation increase above those in the journalling group on post-test SURF scores. Effect sizes were small for post-test SURF scores by assigned group ($d = .20$; see Figure 5).

Table 8

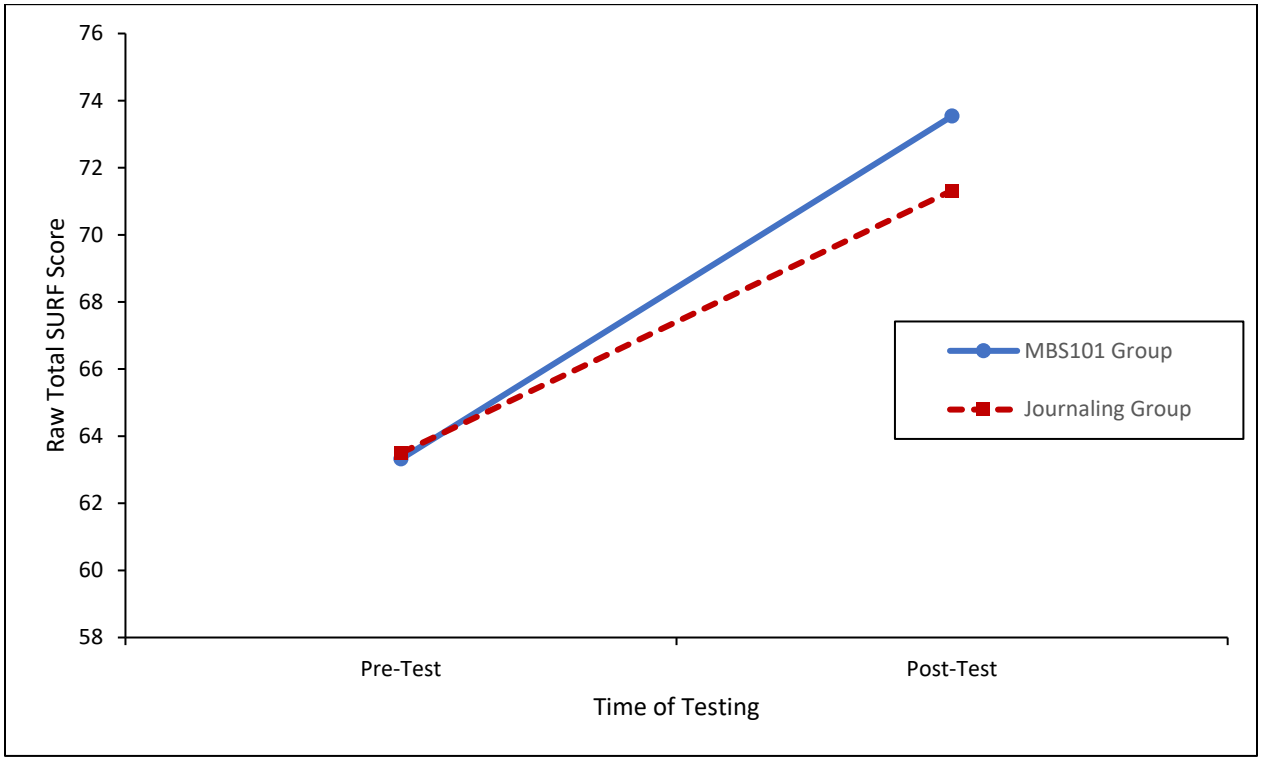
Multiple Regression Coefficients for Predicting Post-Test SURF Scores

Variable	β	95% CI	t	p
Constant	-0.25	[-0.44, -0.07]	-2.66	.008
Pre-test SURF Score	0.69	[0.62, 0.75]	20.75	< .001
MBS101 Group	0.18	[0.02, 0.35]	2.17	.03
Age	0.04	[-0.05, 0.12]	0.83	.41
Sex				
Female	0.19	[-0.01, 0.39]	1.83	.07
Prefer Not to Answer	-0.22	[-1.18, 0.74]	-0.45	.65
Race				
Hispanic or Latino/Latina	0.16	[-0.26, 0.59]	0.75	.45
Black or African American	0.08	[-0.36, 0.53]	0.37	.71
Native American/ American Indian or Alaska Native	0.55	[-0.37, 1.48]	1.17	.24
Asian	0.05	[-0.40, 0.51]	0.23	.82
Native Hawaiian or Pacific Islander	0.68	[-0.63, 1.98]	1.02	.31
Prefer Not to Answer	0.53	[-0.40, 1.45]	1.12	.26

Note: $R^2 = .56$ *(N = 252, p < .001)*

Figure 5

Pre- and Post-Test SURF Well-Being Scores by Group



The model assessing the SWLS yielded a significant regression ($F(11, 240) = 7.24$, $p < .001$, $R^2 = .58$). However, the assigned gratitude group was not a significant predictor of post-test SWLS scores ($p = .24$, 95%CI = [-.06, .26]; see Table 9)

Table 9

Multiple Regression Coefficients for Predicting Post-Test SWLS Scores

Variable	β	95% CI	t	p
Constant	-0.28	[-0.46, -0.10]	-3.02	.002
Pre-test SWLS Score	0.65	[0.58, 0.72]	18.02	< .001
MBS101 Group	0.10	[-0.06, 0.26]	1.18	.24
Age	-0.02	[-0.10, 0.06]	-0.44	.66
Sex				
Female	0.31	[0.11, 0.51]	3.10	.002
Prefer Not to Answer	-0.37	[-1.31, 0.57]	-0.77	.44
Race				
Hispanic or Latino/Latina	0.22	[-0.20, 0.63]	1.02	.31
Black or African American	-0.24	[-0.67, 0.20]	-1.06	.29
Native American/ American Indian or Alaska Native	0.65	[-0.25, 1.55]	1.41	.16
Asian	-0.15	[-0.59, 0.29]	-0.66	.51
Native Hawaiian or Pacific Islander	0.28	[-0.99, 1.55]	0.44	.66
Prefer Not to Answer	-0.49	[-1.39, 0.41]	-1.06	.29

Note: $R^2 = .58$ *(N = 252, p < .001)*

The model assessing PANAS Positive Affect yielded a significant regression (F(11, 240) = 29.01, p < .001, R^2 = .57) with the MBS101 group as a significant predictor with a coefficient of .17 (p = .05, 95%CI = [.002, .33]; see Table 10). When controlling for pre-test scores, age, sex, and race, those in the MBS101 group experienced a .17 standard deviation increase above those in the journalling group on post-test PANAS positive affect scores. Effect sizes were small for post-test PANAS positive affect scores by assigned group (*d* = .10; see Figure 6)

Table 10

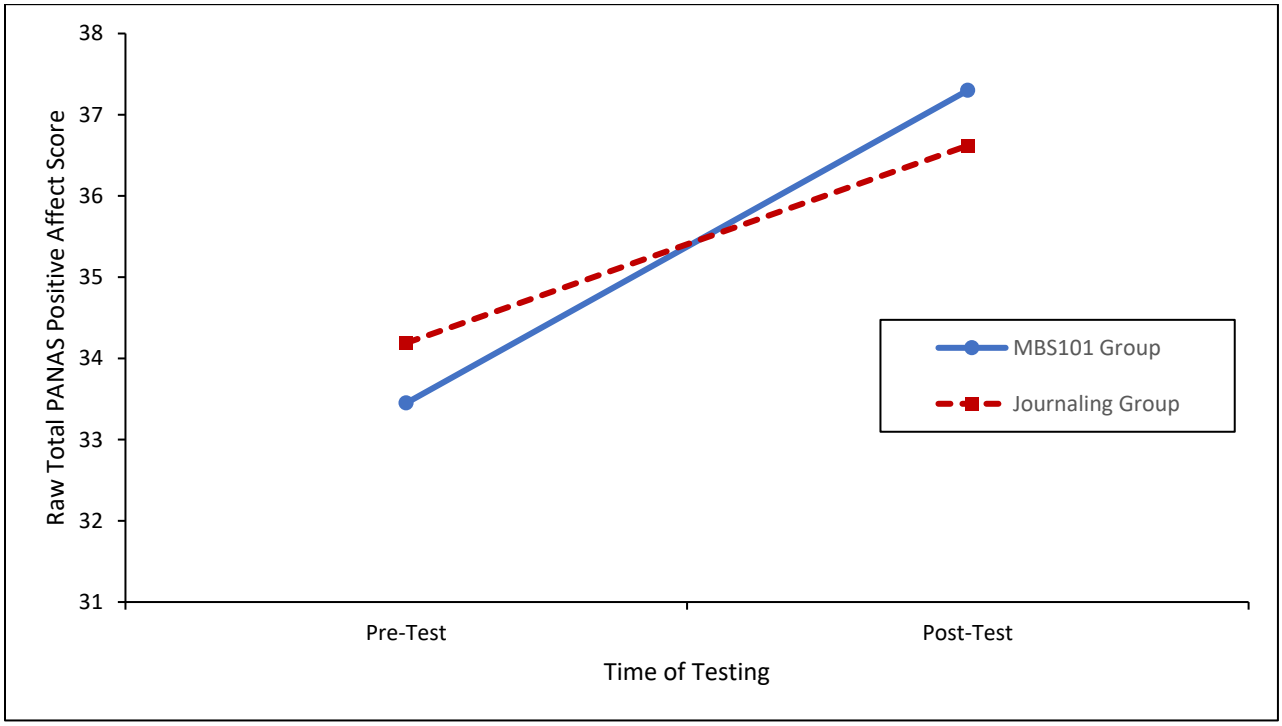
Multiple Regression Coefficients for Predicting Post-Test PANAS Positive Affect Scores

Variable	β	95% CI	t	p
Constant	-0.07	[-0.26, -0.11]	-0.77	.44
Pre-test PANAS Positive Affect Score	0.70	[0.63, 0.77]	18.91	< .001
MBS101 Group	0.17	[0.002, 0.33]	1.98	.05
Age	0.05	[-0.03, 0.13]	1.19	.23
Sex				
Female	-0.004	[0.20, 0.19]	-0.04	.97
Prefer Not to Answer	-0.60	[-1.55, 0.35]	-1.24	.22
Race				
Hispanic or Latino/Latina	0.003	[-0.42, 0.42]	0.01	.99
Black or African American	0.11	[-0.33, 0.55]	0.48	.63
Native American/ American Indian or Alaska Native	0.90	[-0.02, 1.81]	1.91	.06
Asian	-0.22	[-0.67, 0.23]	-0.94	.35
Native Hawaiian or Pacific Islander	0.49	[-0.81, 1.78]	0.74	.46
Prefer Not to Answer	-0.31	[-1.22, 0.11]	-0.66	.51

Note: $R^2 = .57$ *(N = 252, p < .001)*

Figure 6

Pre- and Post-Test PANAS Positive Affect Scores by Group



The model assessing PANAS negative affect yielded a significant regression (F(11, 240) = 23.82, p < .001, R^2 = .52) with the MBS10 group as a significant predictor with a coefficient of -.27 (p < .01, 95%CI = [-.44, -.09]; see Table 11). When controlling for pre-test scores, age, sex, and race, those in the MBS101 group experienced a .18 standard deviation decrease below those in the journalling group on post-test PANAS negative affect scores. Effect sizes were small for post-test PANAS negative affect scores by assigned group (*d* = .17; see Figure 7).

Table 11

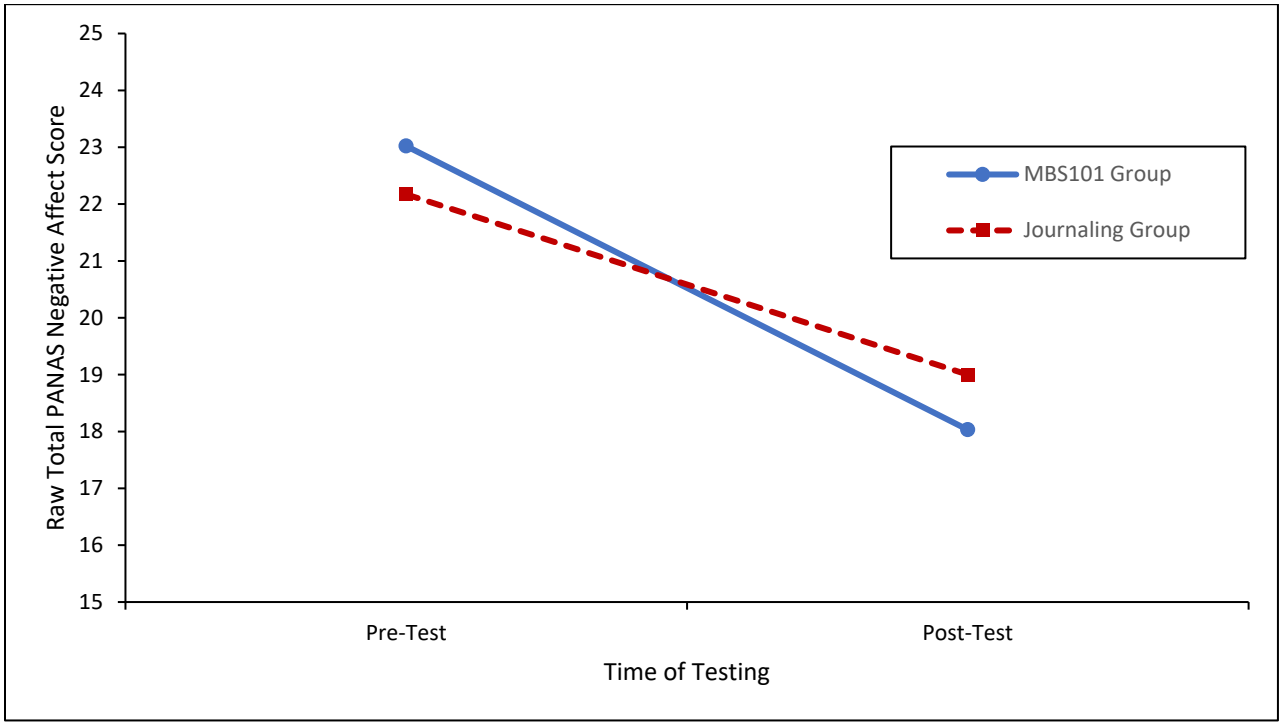
Multiple Regression Coefficients for Predicting Post-Test PANAS Negative Affect Scores

Variable	β	95% CI	t	p
Constant	0.06	[-0.13, 0.25]	0.60	.55
Pre-test PANAS Negative Affect Score	0.67	[0.59, 0.75]	16.34	< .001
MBS101 Group	-0.27	[-0.44, -0.09]	-2.99	.003
Age	-0.16	[-0.24, -0.07]	-3.52	< .001
Sex				
Female	0.09	[-0.12, 0.30]	0.85	.39
Prefer Not to Answer	0.44	[-0.57, 1.45]	0.86	.39
Race				
Hispanic or Latino/Latina	-0.09	[-0.54, 0.35]	-0.40	.69
Black or African American	-0.04	[-0.51, 0.42]	-0.19	.8
Native American/ American Indian or Alaska Native	-0.96	[-1.93, 0.06]	-1.95	.05
Asian	0.15	[-0.33, 0.62]	0.60	.55
Native Hawaiian or Pacific Islander	-0.38	[-1.74, 0.88]	-0.54	.59
Prefer Not to Answer	0.09	[-1.05, 0.25]	0.18	.86

Note: $R^2 = .52$ *(N = 252, p < .001)*

Figure 7

Pre- and Post-Test PANAS Negative Affect Scores by Group



To understand if there was a difference in likelihood to continue practicing gratitude, we conducted a post-hoc analysis paired t-test of responses to the item "How likely are you to engage in gratitude practices on your own in the coming weeks?" by group. Participants in the MBS101 group reported a significantly higher likelihood to continue gratitude practices in the coming weeks ($p < .001$; see Table 12).

Table 12

Paired Sample T-Test Comparing Likelihood to Continue Gratitude Practice by Group

Group	M (SD)	95% CI	t	*p*
Journaling Group	3.80 (0.90)	[3.64, 3.95]	-3.46	< 0.001
MBS101 Group	4.17 (0.79)	[4.03, 4.32]		

Hypothesis 3: Time and Group Interaction

To test whether time spent on gratitude practice had an incremental effect for those in the MBS101 group, we used the second model mentioned in the method section to assess for a time by group interaction. As with hypothesis 2 testing, test scores and minutes per day were standardized to allow for easier interpretation. The findings for model by measure are as follows:

Gratitude

For the MBS Gratitude measure, the regression model was significant ($F(13, 238) = 14.97$, $p < .001$, $R^2 = .44$) with a significant time-group interaction coefficient of .32 ($p = .02$, 95%CI = [.05, .60]; see Table 13). When controlling for age, sex, and race, for every one standard deviation increase in minutes per day of gratitude practice, there was a .32 standard deviation increased difference in the difference between post-test MBS Gratitude measure scores of the MBS101 and journaling groups. In other words, the association between minutes of gratitude practice and improvements in gratitude differed significantly across groups, with this association being stronger in the MBS101 group (see Figure 8).

Table 13

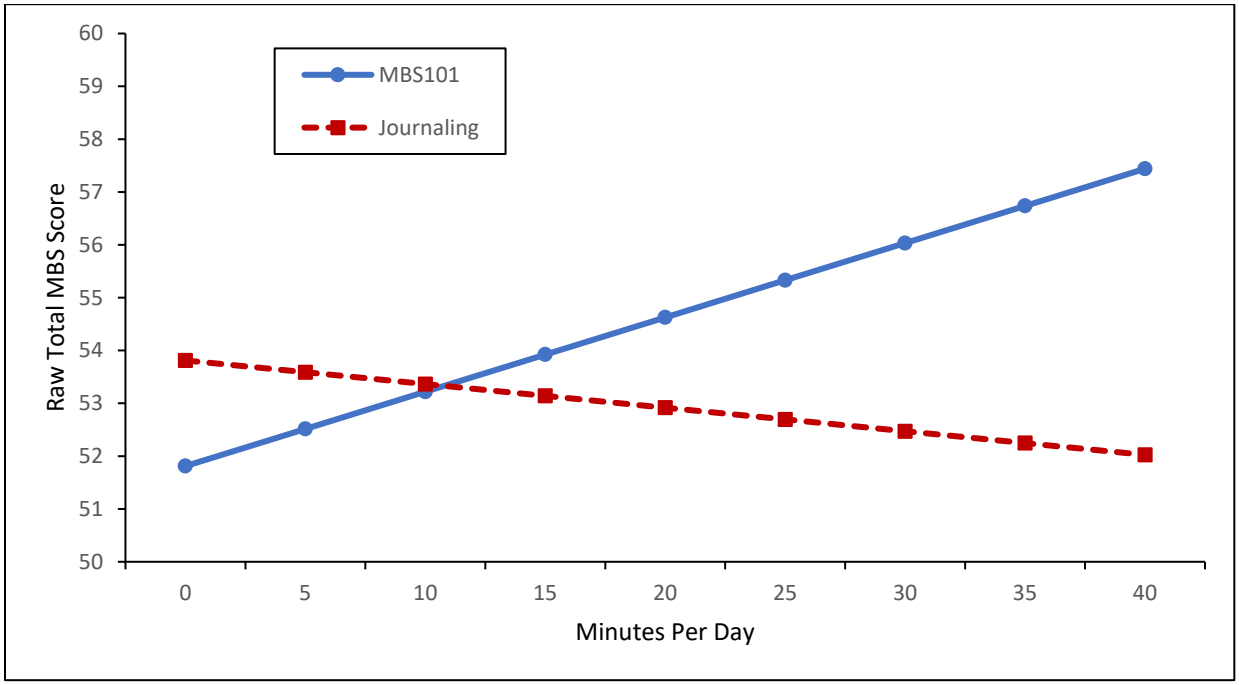
Multiple Regression Coefficients for Predicting Post-Test MBS Scores with the Time X Group Interaction

Variable	β	95% CI	t	p
Constant	-0.52	[-0.86, -0.18]	-2.99	.003
Pre-test MBS Score	0.53	[0.45, 0.62]	12.75	< .001
MBS101 Group	0.12	[-0.16, 0.40]	0.85	.40
Minutes Per Day	-0.07	[-0.25, 0.11]	-0.76	.45
Group X Minutes Per Day	0.32	[0.04, 0.60]	2.29	.02
Age	0.004	[-0.01, 0.01]	0.86	.39
Sex				
Female	0.33	[0.11, 0.56]	2.88	.004
Prefer Not to Answer	-0.39	[-1.47, 0.68]	-0.72	.47
Race				
Hispanic or Latino/Latina	-0.06	[-0.54, 0.42]	-0.26	.80
Black or African American	0.29	[-0.22, 0.80]	1.11	.27
Native American/ American Indian or Alaska Native	-0.24	[-1.28, 0.80]	-0.45	.65
Asian	-0.58	[-1.09, 0.07]	-2.21	.03
Native Hawaiian or Pacific Islander	0.50	[-0.96, 1.97]	0.67	.50
Prefer Not to Answer	0.43	[-0.60, 1.47]	0.82	.41

Note: $R^2 = .44$ *(N = 252, p < .001)*

Figure 8

Plot of Interaction Between Practiced Minutes Per Day and Group on MBS Gratitude Scores



For the GRAT Short Form, the regression model was significant (F (13, 238) = 20.96, p < .001, R^2 = .53) with a significant time-group interaction coefficient of .29 (p = .02, 95%CI = [.04, .55]; see Table 14). When controlling for age, sex, and race, for every standard deviation increase in minutes per day of gratitude practice, there was a .29 standard deviation increased difference in the difference between post-test GRAT-Short Form scores of MBS101 and journaling groups (see Figure 9).

Table 14

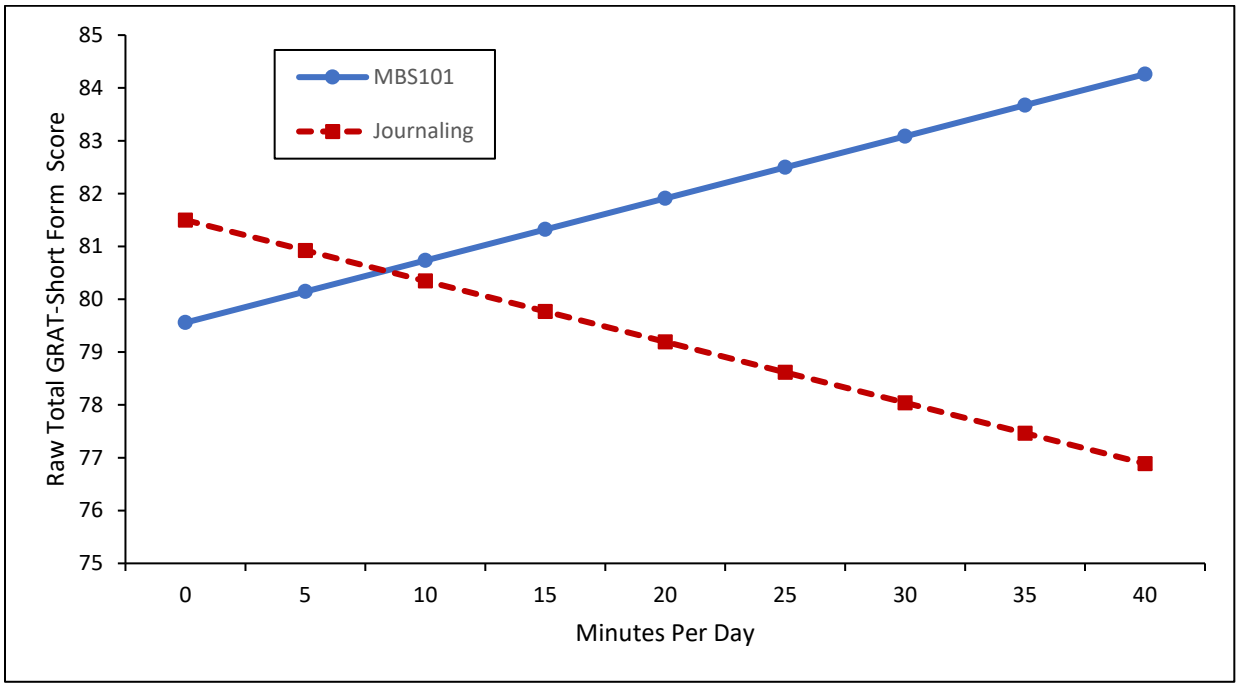
Multiple Regression Coefficients for Predicting Post-Test MBS Scores with the Time X Group Interaction

Variable	β	95% CI	t	p
Constant	-0.57	[-0.89, -0.25]	-3.54	< .001
Pre-test MBS Score	0.57	[0.49, 0.65]	14.42	< .001
MBS101 Group	0.20	[-0.06, 0.46]	1.53	.13
Minutes Per Day	-0.15	[-0.32, 0.02]	-1.74	.08
Group X Minutes Per Day	0.29	[0.04, 0.55]	2.27	.02
Age	0.005	[-0.004, 0.01]	1.08	.28
Sex				
Female	0.34	[0.13, 0.55]	3.17	.002
Prefer Not to Answer	0.23	[-0.76, 1.22]	0.46	.65
Race				
Hispanic or Latino/Latina	0.20	[-0.24, 0.64]	0.88	.38
Black or African American	-0.52	[-0.99, 0.05]	-2.16	.03
Native American/ American Indian or Alaska Native	-0.40	[-1.35, 0.56]	-0.81	.42
Asian	-0.24	[-0.71, 0.24]	-0.98	.33
Native Hawaiian or Pacific Islander	0.42	[-0.94, 1.77]	0.60	.55
Prefer Not to Answer	0.93	[-0.03, 1.88]	1.90	.06

Note: $R^2 = .53$ *(N = 252, p < .001)*

Figure 9

Plot of Interaction Between Practiced Minutes Per Day and Group on GRAT-Short Form Gratitude Scores



Although regression models were significant for the GAC (F (13, 238) = 8.53, p < .001, R^2 = .32) and the GQ6 (F (13, 238) = 5.63, p < .001, R^2 = .37), the time by group interaction was not significant in either of these measure models (p = .30 - .43) (see Table 15, see Table 16)

Table 15

Multiple Regression Coefficients for Predicting Post-Test GAC Scores with the Time X Group Interaction

Variable	β	95% CI	t	p
Constant	8.05	[7.00, 9.11]	15.02	< .001
Pre-test GAC Score	0.40	[0.32, 0.47]	10.13	< .001
MBS101 Group	-0.55	[-1.59, 0.50]	-1.03	.31
Minutes Per Day	0.01	[-0.03, 0.04]	0.28	.78
Group X Minutes Per Day	0.04	[-0.02, 0.10]	1.42	.16
Age	0.002	[-0.02, 0.02]	0.19	.85
Sex				
Female	0.20	[-0.21, 0.61]	0.95	.34
Prefer Not to Answer	-1.47	[-3.40, 0.46]	-1.50	.114
Race				
Hispanic or Latino/Latina	0.44	[-0.42, 1.30]	1.00	.32
Black or African American	0.40	[-0.51, 1.31]	0.87	.39
Native American/ American Indian or Alaska Native	0.68	[-1.20, 2.55]	0.71	.48
Asian	0.24	[-0.70, 1.16]	0.51	.61
Native Hawaiian or Pacific Islander	-0.80	[-3.43, 1.84]	-0.59	.55
Prefer Not to Answer	0.90	[-1.00, 2.76]	0.94	.35

Note: $R^2 = .32$ *(N = 252, p < .001)*

Table 16

Multiple Regression Coefficients for Predicting Post-Test GQ6 Scores with the Time X Group Interaction

Variable	β	95% CI	t	p
Constant	23.85	[21.17, 26.53]	17.42	< .001
Pre-test GQ6 Score	0.35	[0.28, 0.42]	10.23	< .001
MBS101 Group	0.79	[-1.19, 2.78]	0.78	.43
Minutes Per Day	-0.004	[-0.08, 0.07]	-0.11	.92
Group X Minutes Per Day	0.01	[-0.10, 0.12]	0.23	.82
Age	0.02	[-0.01, 0.05]	1.19	.23
Sex				
Female	1.29	[0.51, 2.06]	3.26	.001
Prefer Not to Answer	-2.03	[-5.71, 1.66]	-1.08	.28
Race				
Hispanic or Latino/Latina	0.04	[-1.60, 1.68]	0.05	.96
Black or African American	-0.24	[-1.98, 1.49]	-0.28	.78
Native American/ American Indian or Alaska Native	0.28	[-3.28, 3.84]	0.15	.88
Asian	-0.03	[-1.78, 1.72]	-0.04	.97
Native Hawaiian or Pacific Islander	2.22	[-2.80, 7.24]	0.87	.39
Prefer Not to Answer	4.52	[0.98, 8.07]	2.50	.01

Note: $R^2 = .43$ *(N = 252, p < .001)*

Subjective Well-Being

For the SURF, the regression model was significant (F (13, 238) = 25.62, p < .001, R^2 = .58) with a significant time-group interaction coefficient of .32 (p = 0.01, 95%CI = [.08, .56]; see Table 17). When controlling for age, sex, and race, for every one standard deviation increase in minutes per day of gratitude practice, there was a .32 standard deviation increased difference in the difference between post-test SURF scores of the MBS101 and journaling groups. As with

gratitude outcomes, this is to be interpreted as the association between minutes of gratitude practice and improvements in subjective well-being differed significantly across groups, with this association being stronger in the MBS101 group (see Figure 10).

Table 17

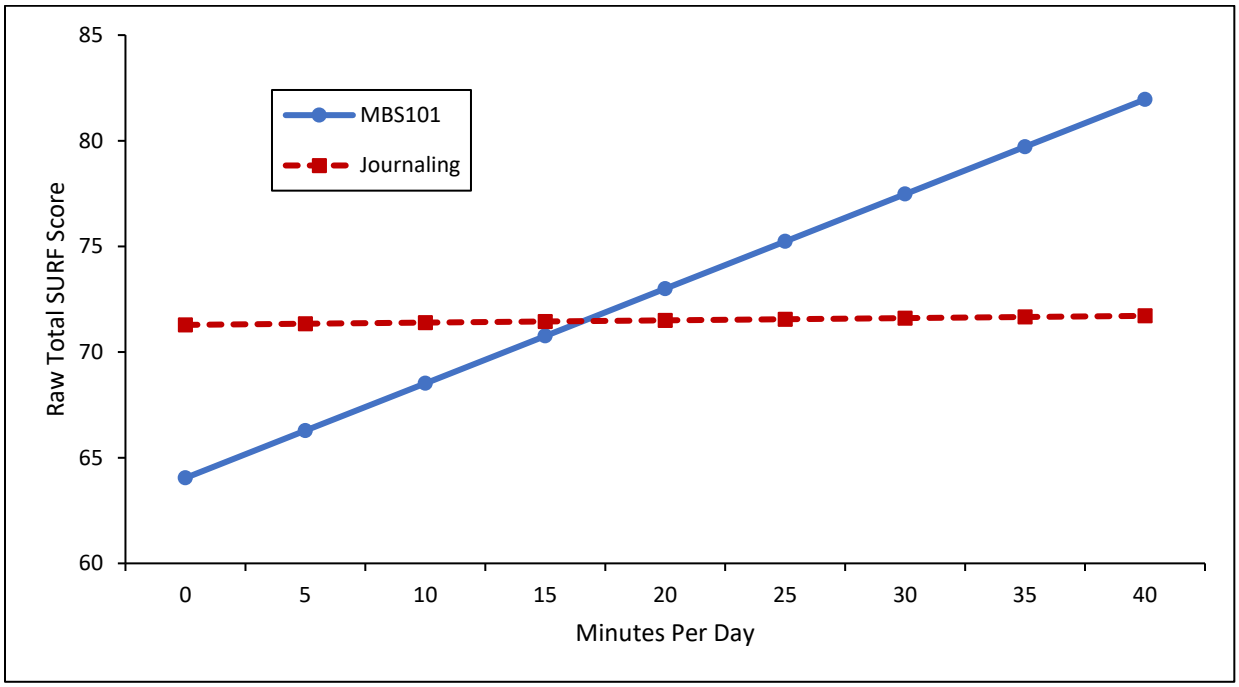
Multiple Regression Coefficients for Predicting Post-Test SURF Scores with the Time X Group Interaction

Variable	β	95% CI	t	p
Constant	-0.31	[-0.60, -0.01]	-2.01	.04
Pre-test SURF Score	0.68	[0.62, 0.75]	21.07	< .001
MBS101 Group	-0.09	[-0.33, 0.16]	-0.69	.49
Minutes Per Day	0.01	[-0.15, 0.17]	0.14	.89
Group X Minutes Per Day	0.32	[0.08, 0.56]	2.64	.01
Age	0.003	[-0.01, 0.01]	0.64	.53
Sex				
Female	0.19	[-0.01, 0.38]	1.86	.06
Prefer Not to Answer	-0.22	[-1.16, 0.72]	-0.46	.64
Race				
Hispanic or Latino/Latina	0.23	[-0.19, 0.64]	1.08	.28
Black or African American	-0.04	[-0.48, 0.40]	-0.16	.87
Native American/ American Indian or Alaska Native	0.46	[-0.45, 1.36]	0.99	.32
Asian	-0.02	[-0.46, 0.43]	-0.09	.93
Native Hawaiian or Pacific Islander	0.95	[-0.33, 2.22]	1.45	.15
Prefer Not to Answer	0.53	[-0.38, 1.43]	1.14	.25

Note: $R^2 = .58$ *(N = 252,* $p < .001$*)*

Figure 10

Plot of Interaction Between Practiced Minutes Per Day and Group on SURF Well-Being Scores



For the SWLS, the regression model was significant (F (13, 238) = 27.49, p < .001, R^2 = .59) with a significant time-treatment group interaction coefficient of .37 (p < .01, 95%CI = [.13, .60]; see Table 18). When controlling for age, sex, and race, for every one standard deviation increase in minutes per day of gratitude practice, there was a .38 standard deviation increased difference in the difference between post-test SWLS scores of the MBS101 and journaling groups (see Figure 11).

Table 18

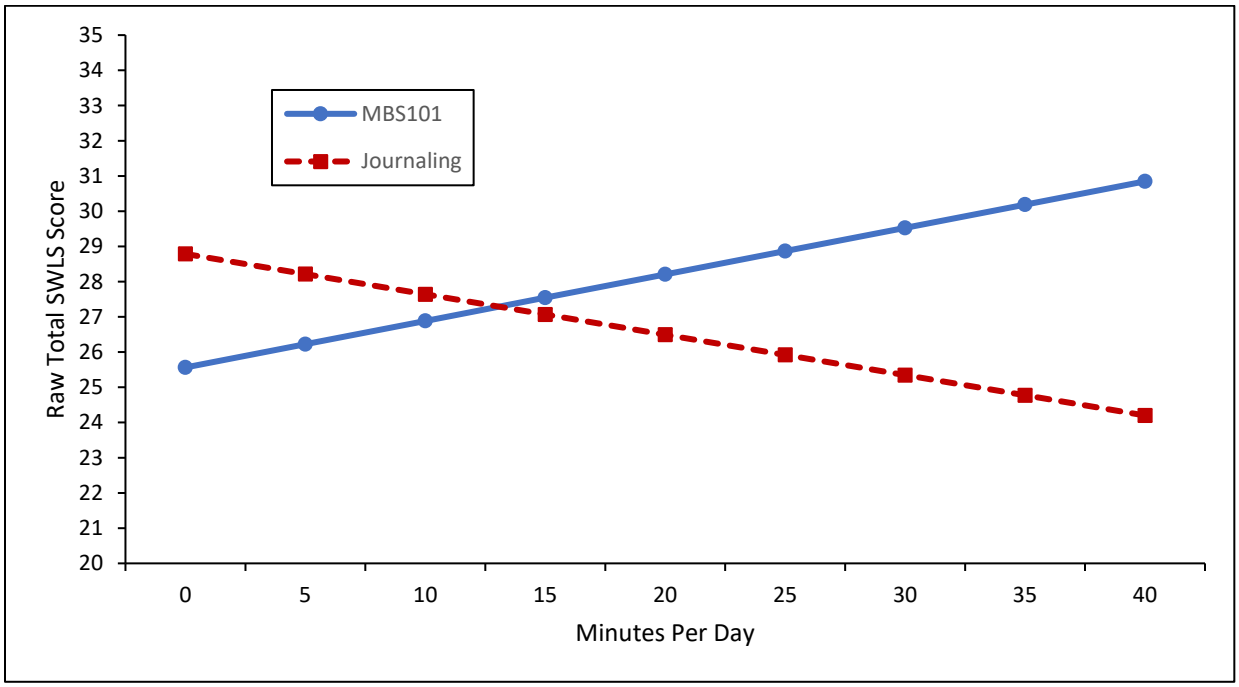
Multiple Regression Coefficients for Predicting Post-Test SWLS Scores with the Time X Group Interaction

Variable	β	95% CI	t	p
Constant	-0.36	[-0.65, -0.07]	-2.42	.02
Pre-test SWLS Score	0.66	[0.59, 0.73]	18.40	< .001
MBS101 Group	0.06	[-0.18, 0.30]	0.49	.63
Minutes Per Day	-0.17	[-0.32, 0.01]	-2.13	.03
Group X Minutes Per Day	0.37	[0.13, 0.60]	3.05	.002
Age	-0.001	[-0.01, 0.01]	-0.31	.76
Sex				
Female	0.31	[0.12, 0.50]	3.14	.002
Prefer Not to Answer	-0.33	[-1.25, 0.59]	-0.70	.48
Race				
Hispanic or Latino/Latina	0.26	[-0.15, 0.66]	1.23	.22
Black or African American	-0.25	[-0.68, 0.19]	-1.12	.26
Native American/ American Indian or Alaska Native	0.61	[-0.28, 1.49]	1.34	.18
Asian	-0.20	[-0.63, 0.24]	-0.89	.37
Native Hawaiian or Pacific Islander	0.44	[-0.82, 1.69]	0.68	.49
Prefer Not to Answer	-0.53	[-1.42, 0.35]	-1.18	.24

Note: $R^2 = .60$ *(N = 252, p < .001)*

Figure 11

Plot of Interaction Between Practiced Minutes Per Day and Group on SWLS Well-Being Scores



The PANAS positive affect scale had a significant model ((F (13, 238) = 25.74, p < .001, R^2 = .58), but did not yield a significant time by group interaction (p = .10; see Table 19).

Table 19

Multiple Regression Coefficients for Predicting Post-Test PANAS Positive Affect Scores with the Time X Group Interaction

Variable	β	95% CI	t	p
Constant	-10.77	[7.46, 14.09]	6.38	< .001
Pre-test PANAS Positive Affect Score	0.73	[0.65, 0.80]	18.80	< .001
MBS101 Group	-2.86	[-6.22, 0.50]	-1.67	.10
Minutes Per Day	-0.05	[-0.07, 0.18]	0.81	.42
Group X Minutes Per Day	0.16	[-0.03, 0.35]	1.66	.10
Age	0.03	[-0.03, 0.08]	0.94	.35
Sex				
Female	-0.03	[-1.34, 1.27]	-0.05	.96
Prefer Not to Answer	-4.07	[-10.31, 2.16]	-1.28	.20
Race				
Hispanic or Latino/Latina	0.37	[-2.39, 3.14]	0.27	.79
Black or African American	-0.03	[-2.97, 2.91]	-0.02	.98
Native American/ American Indian or Alaska Native	5.44	[-0.59, 11.47]	1.77	.08
Asian	-1.81	[-4.77, 1.15]	-1.20	.23
Native Hawaiian or Pacific Islander	4.70	[-3.83, 13.22]	1.08	.28
Prefer Not to Answer	-1.95	[-7.97, 4.06]	-0.64	.52

Note: $R^2 = .58$ *(N = 252, p < .001)*

For the PANAS negative affect scale, the regression model was significant (F (13, 238) = 20.74, p < .001, R^2 = .53) with a significant time-group interaction coefficient of -.27, although it is on the barrier of significance (p = 0.04, 95%CI = [-.52, -.01]; see Table 20). When controlling for age, sex, and race, for every one standard deviation increase in minutes per day of gratitude practice, there was a .27 standard deviation decreased difference in the difference between post-test PANAS negative affect scores of the MBS101 and journalling groups (see Figure 12).

Table 20

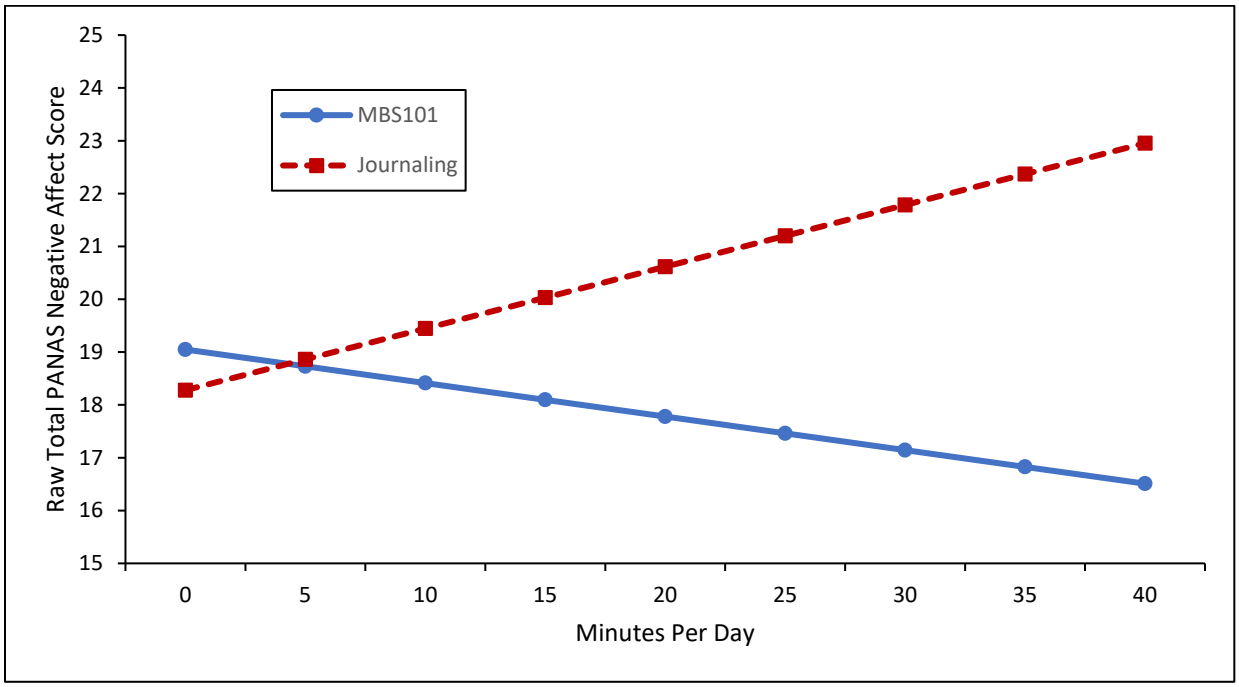
Multiple Regression Coefficients for Predicting Post-Test PANAS Negative Affect Scores with the Time X Group Interaction

Variable	β	95% CI	t	p
Constant	0.59	[0.28, 0.91]	3.67	< .001
Pre-test PANAS Negative Affect Score	0.66	[0.58, 0.74]	16,35	< .001
MBS101 Group	-0.31	[-0.57, -0.05]	-2.35	.02
Minutes Per Day	0.17	[-0.004, 0.34]	2.01	.04
Group X Minutes Per Day	-0.26	[-0.52, -0.01]	-2.05	.04
Age	-0.02	[-0.03, -0.01]	-3.71	< .001
Sex				
Female	0.09	[-0.11, 0.30]	0.89	.37
Prefer Not to Answer	0.42	[-0.58, 1.42]	0.83	.41
Race				
Hispanic or Latino/Latina	-0.11	[-0.55, 0.33]	-0.50	.62
Black or African American	-0.07	[-0.53, 0.40]	-0.28	.78
Native American/ American Indian or Alaska Native	-0.94	[-1.90, 0.02]	-1.93	.05
Asian	0.17	[-0.30, 0.64]	0.72	.47
Native Hawaiian or Pacific Islander	-0.46	[-1.81, 0.90]	-0.66	.51
Prefer Not to Answer	-0.05	[-1.01, 0.91]	-0.10	.92

Note: $R^2 = .53$ *(N = 252, p < .001)*

Figure 12

Plot of Interaction Between Practiced Minutes Per Day and Group on PANAS Negative Affect Scores



Discussion

The primary purpose of this study was to examine the potential benefits of an online gratitude training module that combines psychoeducation with regular practice from a menu of evidence-based gratitude exercises. First, we examined whether those who engaged with the MBS101 module experienced increases in gratitude and subjective well-being from the beginning to end of the study. Our results support this hypothesis, suggesting that those who engaged with the module had reliable increases in gratitude and subjective well-being. The second focus of this study aimed to determine if the My Best Self 101 gratitude module had relatively better than outcomes the current gold standard of gratitude practices – the gratitude journal. Our analyses suggest that this hypothesis is supported, but the effect is not as strong as we had anticipated. Finally, the third aim of the study was to determine if those who spent more

time engaging in gratitude practice with the MBS101gratitude module experienced increased gains in gratitude and subjective well-being beyond the gains experience by those in the journalling group. This hypothesis was also only moderately supported by our results with time devoted to practice having more impact on subjective well-being than gratitude. In summary, the results indicate that the MBS101 gratitude module works to increase gratitude and subjective well-being and it produces relatively better outcomes than the gold-standard gratitude practice of journaling.

Aim One

When considering the gains from pre- to post-test assessment of gratitude and subjective well-being for the MBS101 gratitude module, these findings provide support that gratitude practices can produce positive benefits. Such findings add further proof to the findings that gratitude and well-being are linked, and that by increasing gratitude you can increase well-being (Dickens, 2017; Portocarrero et al., 2020). Additionally, these large gains in gratitude in pre- to post-test assessment align with other recently developed gratitude strategies that use technology in order to make gratitude practice more comprehensive and rigorous (Heckendorf et al., 2019; Swain et al., 2020). These initial findings suggests that on average those who engage with the MBS101 gratitude module can expect to experience increases to their gratitude and subjective well-being. Furthermore, this strengthens the argument that more involved gratitude resources with psychoeducation and variety are needed to increase gratitude outcomes.

Additionally, thus study adds replicative evidence to suggest that gratitude journaling works to increase gratitude and subjective well-being (Emmons & McCullough, 2003b). Though the gains and subsequent effect sizes for the journaling group were smaller than those in the MBS101 group, gratitude journaling did prove to produces higher post-test gratitude and

subjective well-being. This supports the practice of gratitude journaling as a gold-standard comparison for newly developed gratitude practices instead of inactive or alternative activity control groups.

Aim Two

Based on the growing body of literature supporting modular, transdiagnostic approaches, we predicted that the MBS101 module would have increased effectiveness beyond the gold-standard gratitude journal approach. This hypothesis was only moderately and partially supported. Given the majority of gratitude and subjective well-being measures yielded significant results, we conclude that the MBS101 gratitude module does provide incremental gain beyond using a gratitude journal alone. However, effect sizes were smaller than we had predicted, suggesting such incremental gains are limited.

When considering these results occur when compared to the gold-standard practice of gratitude journaling, these findings provide support that the modular based approach for treatment and training material is a viable and effective approach (Evans et al., 2020; Stumpp & Sauer-Zavala, 2022; Weisz et al., 2012). To date, there hasn't been research on a personalized gratitude approach. It is possible that this incremental gain is due to the individual person's ability to adapt the gratitude practices to their needs. Thus, instead engaging in the same rote practice of writing in a gratitude journal every other day, they can adapt their gratitude practice to continue to be exciting and meaningful. This is further evidenced by the finding that individuals in the MBS101 group reported a higher likelihood in continuing in gratitude practices than the journaling group.

Indeed the very adaptations contained in the MBS101 gratitude module may the response demanded by researchers calling for more intensive gratitude practices (Cregg & Cheavens,

2021; Davis et al., 2016). Current research suggested new approaches take on a more comprehensive approach, involving several strategies with more rigor. The MBS101 gratitude module asks its users to engage every day while providing varied resources to keep such daily practice new and exciting. Thus, it seeks to take the stability of already established gratitude practices, combine it with the evidence that suggests adaptable treatment leads to better outcomes, and produce a gratitude training that allows for incremental gains in gratitude and subjective well-being.

Aim Three

As the MBS101 gratitude module is a flexible resource created to adapt to individual needs and interests, the third aim of this study sought to understand if spending more time interacting with varied content on a personally adaptable schedule provided increased benefit beyond spending more time on the same routine gratitude practice. Our hypothesis was partially supported by our results. When considering gratitude, results were mixed. The two more extensive gratitude measures provided significant results while the two shorter measures did not. Subjective well-being results provided stronger support to our hypothesis with the majority of measures providing significant interaction effects. Given that this effect showed up on only half of the gratitude measures, it is still inconclusive if extra time practiced within the MBS101 gratitude module adds incremental gratitude gains. As such, these results provide initial support that time spent on practice yields different benefits based on the adaptability or rigidity of the gratitude practice. However, this should be interpreted with caution, and these findings require further validation.

These results add further strength to support the idea that comprehensive, adaptable gratitude practices – as is the case with the MBS101 gratitude module – are a viable gratitude

training resource. Those who spent more time familiarizing themselves with the module and its strategies experienced even larger increases to their sense of gratitude and subjective well-being. In opposition to this, those who spent more time journalling decreased in their rate of increasing gratitude and subjective well-being. One interpretation of this finding is those who journalled began to grow stagnant, even with increased practice. Alternatively, those who interacted with the module were provided with enough resources to keep their practice engaging and enriching enough to continually increase feelings of gratitude and well-being. This adds additional burden of proof to the recommendations provided by Davis et al. (2016) as they may have been correct in their assumptions that the reduced effects of gratitude practices are due to a lack of diversity of content. Furthermore, this adds more burden of proof to the general treatment trend that suggests incremental gain can be found in providing treatment that is both more comprehensive and adaptable to the individual's needs – including time dosage of treatment.

Previous research has suggested that gratitude journaling should be used sparingly, as overuse may decrease the desired effect (Emmons & Stern, 2013; Lyubomirsky et al., 2005). Our studies add further evidence to this theory. For individuals in the gratitude journal group, a higher minutes per day ration yielded decreases on average in gratitude and subjective well-being. These findings suggests that with gratitude journaling, less is more. Additionally, this provides strength to the MBS101 gratitude module as gratitude journaling is included as only one of many practices an individual can engage with. When practiced as recommended, this allows an individual to gain from the benefits of gratitude journaling without suffering the deterioration of well-being that comes with over-using this practice. If an individual insists on consistently using gratitude journal, it may be helpful to apply similar principles of adaptation and use different journal prompts so that they don't become too adapted to the process.

Strengths

The current study displayed several strengths that support the claims that can be made by these results. Firstly, this study implemented a randomized control trial study design method. Participants were assigned group assignment by a random number generator and were never made aware of the other group's gratitude instructions. By doing so, this successfully eliminated a degree of researcher bias from the findings as the researchers were not directly responsible for who was assigned with gratitude practice.

However, instead of applying a wait-list control, this study sought to apply the current gold-standard gratitude training practice as the comparison group. This was done in order to provide a more rigorous study that avoided spurious findings being due to a weak control rather than actual study effectiveness (Davis et al., 2016). Thus though some effect sizes were small, they were small in comparison to what is considered to be the most empirically supported gratitude training practice. This possibly provides a larger burden of proof for the MBS101 gratitude module's effectiveness than if it were to have moderate effect sizes with a wait-list control group.

Limitations

There were several limitations to our study that warrant further discussion. As such, they curtail the claims we can make based on our findings. While not unique in this problem, one of the main limitations within the study is the homogeneity of the sample. Of our participants, 76% were female, 89% were white, 77% were from the western United States, 63% had either completed some college or were currently college students, 72% were single, and 96% identified as Christians. Additionally, the mean age for participants was approximately 24 years of age. When taken in summation, we can conclude that the majority of our participants were white,

single, female, college students, at a Christian university in the western United States. Thus, the interpretation of these findings to other populations is limited. This may be due to the method of sampling for our study. Participants were recruited in a snowball sampling method by posting social media flyers posted mainly by researchers or close family and friends. Additionally, participants were recruited through a study system at a university that grants students points that can be used for points in their classes. Thus, more rigorous sampling methods would yield a more diverse sample which would help broaden the interpretation of such findings.

Additionally, the minimum requirement to participate in this study was set minimal. Participants were admitted into the study so long as they had access to the internet, had an email, lived in the United States, were a native English speaker, and were above the age of 18. This study did not limit participants based on baseline gratitude levels. It may be possible, given that most of the sample identified as Christian, which has a history of emphasizing gratitude, that many of our participants had a high baseline gratitude. This may have made it harder to detect an effect as ceiling effects may have been at play. The opposite may have been true, but we simply do not know because we did not screen for it.

On a related note, this study did not consider clinical diagnoses of participants. Instead, we sought to examine how the MBS101 gratitude module affected the general population. It may be possible that the MBS101 gratitude module is more or less effective for individuals who struggle with depression, anxiety, attention-deficit/hyperactivity disorder, obsessive compulsive disorder, or any other disorder, but that knowledge is still unknown.

Lastly, given the small effect sizes of the MBS101 gratitude module when compared to gratitude journaling – which has been criticized for its small effect sizes – it is still unclear as to how much incremental benefit an individual gains from using the MBS101 module compared to

conducting their life as normal. We do know that for the majority of our outcome measures, the MBS101 module had minimally higher results than using a gratitude journal alone, but the question posed by Cregg & Cheavens (2021) as to whether or not using a gratitude practices are an effective use of time remains partially unanswered. Based off the information in this study, we have reason to believe that the MBS101 gratitude module is worth more time and effort than a gratitude journal, but we do not know how much more time and effort it is worth.

Future Directions

Despite the effect of the MBS101 gratitude module being smaller than predicted, the module shows promise for being a more effective treatment for gratitude and subjective well-being than other more common gratitude treatments. Future directions should focus on replication of these findings by outside labs seeking to solidify or disprove the findings from this study. Furthermore, along with including a gold-standard gratitude journal group it may be beneficial to add an expressive writing or waitlist control group to further answer the question of how much incremental validity the MBS101 gratitude module adds to gratitude treatments. Per the comments of previous meta-analyses that criticize the use of a waitlist control group to inflate findings (Davis et al., 2016), we do not suggest comparing the MBS101 module to a control group alone. Rather we recommend that future research includes a control group in addition to a traditional gratitude practice group to distinguish how effective the MBS101 module is compared to these two different benchmarks.

Additionally, testing this study further on clinical populations, such as depression and anxiety, may be beneficial to determine if this treatment is a helpful, accessible tool for diagnoses that are marked by increased negative affectivity. Given that clinical samples represent a very small of the total population of gratitude intervention studies (Cregg & Cheavens, 2021),

our knowledge of how gratitude practices can effect clinical symptoms is limited. Though previous evidence points to larger associations between dispositional gratitude and well-being (Portocarrero et al., 2020), whether increasing gratitude produces similar results is still widely unexplored.

Lastly, with the rise of more online and/or phone-based gratitude training platforms, it may be beneficial to compare the MBS101 gratitude module to others to determine the relative effectiveness of these different gratitude resources.

Conclusion

This study sought to provide evidence that the My Best Self 101 gratitude module was more effective in increasing gratitude than the gold-standard practice of gratitude journaling. Findings from this study suggest that the MBS101 module is moderately more effective than gratitude journaling in areas of gratitude and subjective well-being. However, more research is needed to solidify such findings. Granting this initial study shows promise, we encourage others to use the MBS101 gratitude module to gain a better understanding of how we can use flexible, accessible tools to help people improve.

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