How does daily gratitude journaling impact psychological flexibility, and is this relationship moderated by the severity of depressive symptoms?

Elisa Greiser (974135)

Department of Clinical Psychology, Utrecht University

Master Thesis

Supervisor: Dr. Michaela Schok, Utrecht University

External supervisor: Dr. Sara Bartels, Maastricht University

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Abstract

Psychological flexibility (PF) is a key factor of mental health and, therefore, a promising target for intervention to improve long lasting well-being. A large body of research demonstrates the broad benefits of GJ. However, whether it can be used as an intervention to enhance PF has not yet been investigated. Consequently, the study examined the potential effect of GJ on PF and whether this relationship is moderated by depressive symptoms (DS). A sample of 58 young professionals was randomly assigned to either a 10-day GJ intervention or an active Digital Diary (DD) comparison condition, both conducted via the m-path Platform. Results showed that higher PF was significantly associated with lower DS. In contrast, GJ did not improve PF significantly more than the DD group. Additionally, the relationship between GJ and PF was not moderated by DS. These findings suggest that while PF is an important predictor of mental health, GJ may not be the most effective method to enhance PF. The study represents many limitations, such as insufficient power due to a small sample size. Future studies with larger and more diverse samples, longer intervention durations, and consideration of trait gratitude are needed to further clarify this relationship.

Keywords: Psychological flexibility, gratitude journaling, depressive symptoms, young professionals, well-being, acceptance and commitment therapy, m-path

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According to the World Health Organization, approximately 280 million individuals worldwide suffer from depression, making it the most prevalent mental health disorder. In recent years, the number of diagnoses has increased even further due to social stress factors such as economic instability, climate change, and the COVID-19 pandemic (WHO, 2023). With an estimated burden to German society of 15.6 billion per year and a shortage of available therapy places, finding alternative methods specifically focused on prevention is necessary (Krauth et al., 2014). Psychological Flexibility (PF), a fundamental aspect of mental health (Kashdan & Rottenberg, 2010), represents a relevant focus for interventions such as gratitude journaling (GJ). Consequently, this study aims to investigate the impact of GJ on PF and whether this relationship is moderated by depressive symptoms (DS) in a sample of young professionals.

PF refers to the ability to adapt one's thoughts, emotions, and behavior to different situations-capacities that are important for well-being (Lucas & Moore, 2019; Kashdan & Rottenberg, 2010). It is an essential resource as it enables us to be open to experiences, accept difficult emotions, and act according to values (Hayes et al., 2011). Acceptance and Commitment Therapy (ACT) identifies PF as the core mechanism behind its therapeutic approach and breaks it down into six interconnected skills: acceptance, defusion, present moment awareness, stable self-awareness, values, and committed action (see Gloster et al., 2021, for more). An extensive amount of research underscores the role of PF in improved emotional regulation (Hayes et al., 2012; Kashdan & Rottenberg, 2010), life satisfaction (Fledderus et al., 2012), and stress adaptation (Bryan et al., 2015). Based on these findings, Gloster and colleagues (2021) developed and validated an instrument called Psy-Flex, which aims to assess all six components of PF using a six-item self-measure questionnaire.

From a clinical perspective, a lack of PF is associated with several psychopathologies (Bryan et al., 2015; Kashdan & Rottenberg, 2010). Depressed people are very inflexible, as they struggle to cope with stressors, have difficulties performing actions that align with their values, and show rigid thinking patterns like rumination (Hayes et al., 2012; Fledderus et al., 2012; Kashdan & Rottenberg, 2010). These factors contribute to the onset and maintenance of the disorder. By enabling people to face difficult emotions rather than suppress them and to accept situations that cannot be changed, PF acts as a protective factor against psychopathology (Fonseca et al., 2019; Kashdan & Rottenberg, 2010). All this points out the importance of enhancing PF to reduce psychological symptoms and improve long-term health (Fledderus et al., 2010).

PF is especially relevant for young professionals, a group that faces challenges such as job insecurity, new social roles, high-pressure environments, and evolving identity and life goals, thus requiring constant adaptability (Eisenberg et al., 2007; Westhoff et al., 2024). High PF helps to focus on long-term goals despite setbacks, which is a useful skill in academic and early career contexts (Kashdan & Rottenberg, 2010). This was supported by a study where students with higher PF were better able to persist through academically challenging situations, in contrast, a lack of PF often led to procrastination or withdrawal (Jeffords et al., 2018). Besides, young professionals display a high-risk group for developing mental disorders (Eisenberg et al., 2007; Jeffords et al., 2018). With a prevalence of 30%, the depression rates in students are significantly higher than in the general population (Ibrahim et al., 2012). In addition to this, a study conducted among medical students revealed that 6% reported suicidal thoughts (Goebert et al., 2009). Given these findings, efforts to enhance PF in young professionals are necessary and could improve resistance to stressors, increase job satisfaction, and prevent the onset of psychopathology (Jeffords et al., 2018).

GJ, which has been well-documented to promote positive emotional states, could have the potential to improve PF (Emmons & McCullough, 2003; Rutschmann et al., 2024). In GI, participants are usually asked to make a daily list of things for which they are grateful (Flinchbaugh et al., 2012; Kerr et al., 2006; Sansone & Sansone, 2010; Wood et al., 2010). GJ offers several advantages as it is simple to use, time and cost-effective, has low dropout rates, and does not need qualified psychologists (Dickens, 2017). Doing GJ increases positive reflection, which improves well-being, emotional regulation, life satisfaction, and resilience (Dickens, 2017; Komase et al., 2021; Wood et al., 2010). On top of that, GJ has been demonstrated to reduce depressive symptoms (Emmons & McCullough, 2003). One explanation is that GJ helps to shift from negative to positive thinking patterns, thereby counteracting inflexible cognitive tendencies that often occur in depressed individuals (Cregg & Cheavens, 2020; Lin & Yeh, 2013). While it was found to be effective in the context of psychopathology (Emmons & McCullough, 2003), it can be especially useful for individuals who do not suffer from mental disorders or only show moderate symptoms (Diniz et al., 2023). This highlights its value as a useful tool for early prevention methods.

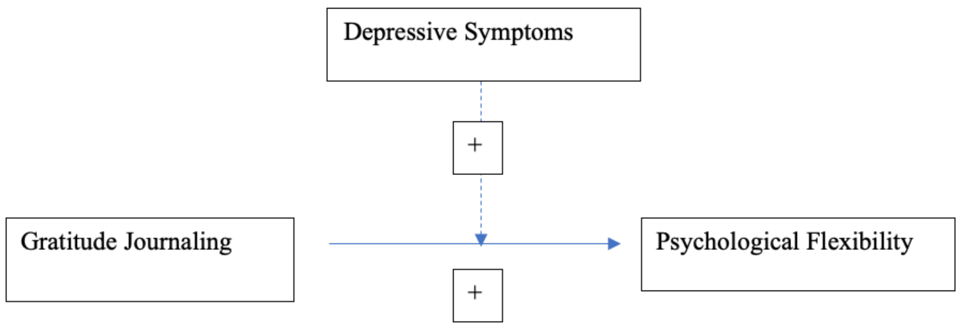
Although there is no direct research available, there are theoretical reasons to believe that GJ could enhance PF. GJ improves coping and adaptation to life stressors (Işık & Ergüner-Tekinalp, 2017), which are fundamental for PF. Furthermore, GJ helps reduce rumination and stress (Cregg & Cheavens, 2020; Lin & Yeh, 2013), which can enhance defusion. In addition, GJ can help identify personal meaningfulness and enhance awareness of what "really matters", which could reinforce key components of PF, such as committed action and chosen values (Ackerman, 2020).

To date, there are only a few studies investigating the moderating role of DS in gratitude interventions (GI), and these have not yet reached a consensus (Cregg & Cheavens, 2020; Harbaugh & Vasey, 2014; Sin & Lyubomirsky, 2009). A meta-analysis of 51 positive psychology interventions points out that individuals with more severe depression often benefit more from such interventions than those with milder symptoms (Sin & Lyubomirsky, 2009). In line with this, Harbaugh and Vasey (2014) found that DS significantly moderated the effects of GI. However, a more recent meta-analysis by Cregg and Cheavens (2020) reported no such effect, leaving the moderating role of DS in the context of GI uncertain. Considering the established link between PF and depression and the mixed results regarding its moderation effect, it is important to investigate whether the severity of DS influences the effectiveness of GJ for PF. A better understanding of this interplay can help develop more targeted and better mental health interventions.

Although research consistently shows the mental health benefits of GJ practices and the importance of PF for mental health, the direct impact of GJ on PF has not yet been investigated. In response to this gap, the present study aims to shed light on the impact of a 10-day GJ intervention on PF in young professionals. In addition, it will examine whether the relationship between GJ and PF is moderated by the severity of DS. More specifically, it is hypothesized that higher levels of PF will be negatively associated with DS (H1). Additionally, it is expected that participants in the GJ group will show a greater increase in PF compared to those in the Digital Diary group (DD) (H2). Finally, it is hypothesized that DS moderates this relationship. Specifically, it is expected that individuals with higher DS scores will show greater improvements in PF compared to those with lower scores after the GJ (H3) (See Figure 1). This study will provide a starting point for understanding GJ in the context of PF and might contribute to identifying further interventions to improve PF and ultimately mental health.

Figure 1:

Conceptual Diagram of the Hypothesized Moderation Model



Methods

Study Design

This study was part of a larger project, “Tracking Psychological Flexibility in Daily Life,” conducted by Utrecht University in collaboration with seven other master’s students under the supervision of Dr. Michaela Schok and Dr. Sara Bartels. The study was a quantitative online research project with a pre-post design using Ecological Momentary Assessments (EMA) on a non-clinical sample of young professionals. The m-Path platform was chosen because it allowed for both intervention delivery and real-time collection of EMA data in participants' daily environments (Mestdagh et al., 2023). The 10-day intervention took place from December 12 to December 22, 2024, whereby participants (n = 58) were randomly assigned to either the GJ Group or the DD condition. The focus was on assessing changes in PF after the GJ intervention. All participants completed twice-daily EMA in the m-path app, while one group additionally filled out a daily GJ. Ethical approval was obtained from Utrecht University (approval number: 24-2239; date of approval: November 22, 2024).

Participants

The target group was young professionals aged between 18 and 35 (M = 24.6, SD = 2.4). Participants were recruited between 03.12.2024 and 11.12.2024 through various social media platforms, including WhatsApp, Instagram, and Facebook, with advertisements for the chance to win a 100€ Amazon voucher. Inclusion criteria required fluency in English and access to a smartphone compatible with the m-Path app. Additionally, participants needed to be students, working, or both. Participant enrollment, allocation, and retention information are provided in line with the flow diagram (Figure 1). The primary reasons for the exclusion of the study were the lack of complete pre- and post-measurements, a compliance rate under 30 percent, or not meeting inclusion criteria. The total sample consisted of 58 participants. Of these, 23 identified as male, 34 as female, and one as non-binary/gender non-conforming. Table 1 illustrates an overview of participant demographic information.

Figure 2:

Participant Flow Chart

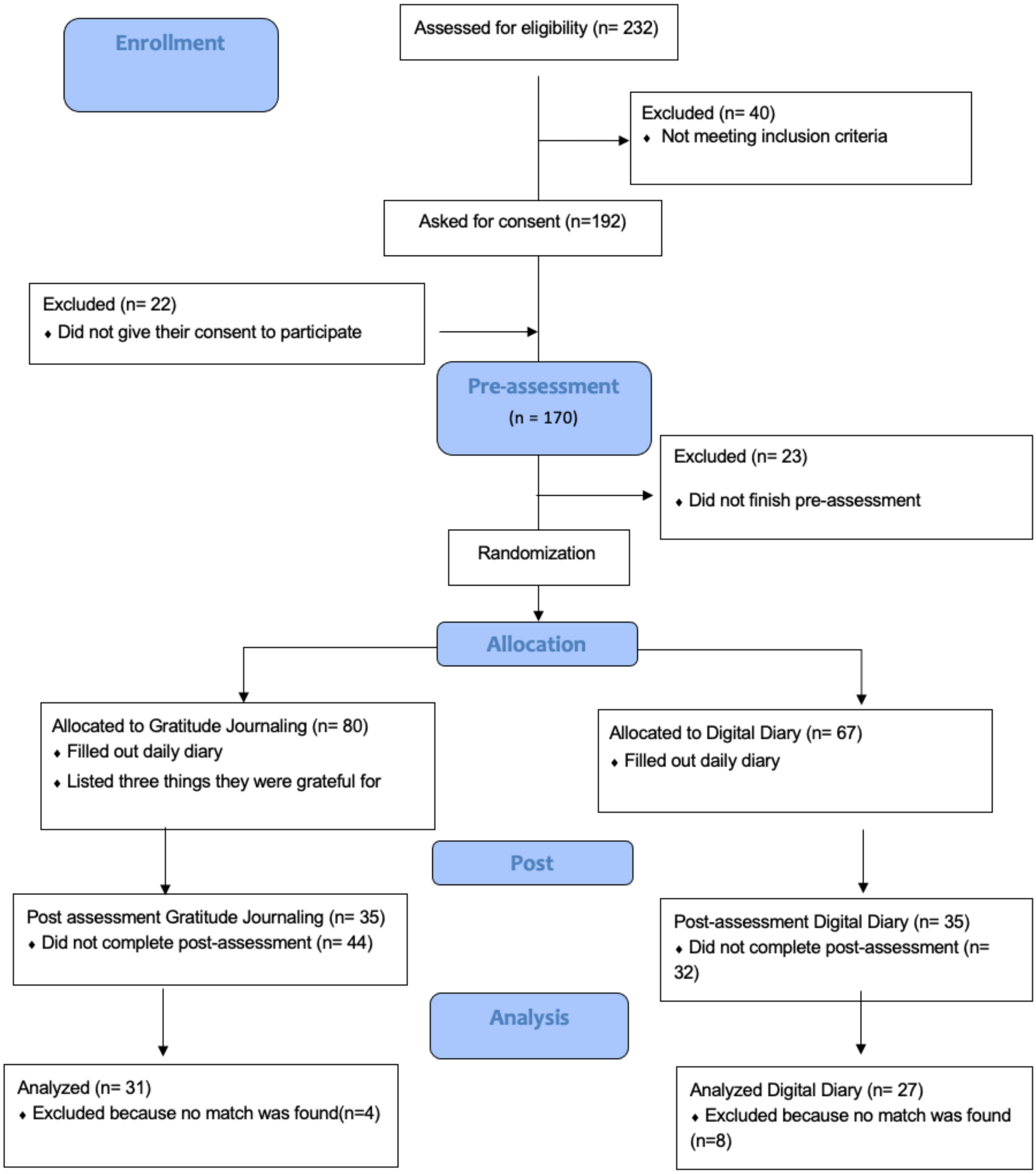


Table 1

Sociodemographic Characteristics of Participants at Baseline

Baseline Characteristics	Digital Diary		Gratitude Journaling		Full Sample	
	N	%	N	%	N	%
Gender						
Female	14	41.2	20	58.8	34	58.6%
Male	13	56.5	10	43.5	23	39.7%
Race						
Black or African American	1	100	0	0	1	1.7%
Hispanic	1	100	0	0	1	1.7
Multiple Ethnicity	1	14.3	6	85.7	7	12.1
Other	0	0	1	100	1	1.7
White / Caucasian	24	51.1	23	48.9	47	81.0
American Indian or Alaskan Native	0	0	1	100	1	1.7
Young Professional Status						
Student	10	43.5	13	56.5	23	39.7%
Working	3	42.9	4	58.1	7	12.1%
Working Student	14	50	14	50	28	48.3%

Note: N= number of Participants (n=58). Participants were on average 24.6 years old (SD= 2.4), and participant age did not differ by condition.

Procedure

Following recruitment, the study began with an online survey on Qualtrics, where participants first provided informed consent. Once consent was obtained, participants completed demographic and baseline assessments: experience with GJ, social activism status, DS (DASS-21), mental health (MHC-SF), and physical activity status (see Appendix D). Participants were randomly allocated via

Qualtrics to either the GJ or DD condition (comparison condition). To ensure proper participation, a virtual meeting via Calendly was scheduled with a researcher, in which participants received instructions on using the m-Path app, and the researcher set up assessment notifications according to the assigned condition. The 10-day intervention period took place from December 12 to December 22, 2024. During this period, participants in both conditions were notified twice a day via m-Path at 12:00 PM and 7:00 PM, reminding them of their daily measurements (PF, perceived stress, well-being, and physical activity). To complete the standard daily measurements, participants in the GJ condition were asked at the evening Check-in (7:00 PM) to list three things they were grateful for. For each notification, the participants had a two-hour response window, with a reminder sent every 30 minutes. The first daily assessment of PF, collected via the m-Path app, was used as the pre-intervention baseline measurement. The final PF measurement was taken from the last daily assessment recorded in the m-Path app and used as the post-intervention measure.

Instruments

Pre- and post-measurements

The present study primarily focuses on the Gratitude Condition, as well as the effects of DS and PF. Other collected variables are not central to this analysis.

Psy-Flex

The Psy-Flex is a self-report instrument consisting of six items, each rated on a 5-point Likert scale ranging from 1 (very seldom) to 5 (very often). An example of an item is, "Even if I am somewhere else with my thoughts, I can focus on what's going on in important moments." The items reflect the core processes of PF, and the total score is calculated by summing the scores of the individual items (Gloster et al., 2021). Higher scores on the Psy-Flex indicate greater PF. The Likert scale was adapted for the study using a 10-point Likert, focusing on the past 2 hours instead of 7 days. The present study exhibited a Cronbach's α of 0.8.

Depressive symptoms (DASS-21)

DS was assessed using the Depression Anxiety Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a validated self-report measure consisting of 21 items, divided into three subscales: Depression, Anxiety, and Stress. Each subscale contains seven items, with participants responding based on their experiences over the past week. Responses are rated on a 4-point Likert scale, ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much or most of the time"). For this study, only the Depression subscale was analyzed. Sample items from this subscale include statements such as "I felt that I had nothing to look forward to" and "I felt downhearted and blue." Higher scores on the Depression subscale indicate greater levels of DS. The study exhibited a Cronbach's α of .85.

Data-Analysis

A priori power analyses were conducted using G*Power 3.1, determining the sample size. With $\alpha = .05$, a sample of N = 166 participants was required to detect effect sizes as small as $f^2 = .08$. All statistical analyses were conducted using SPSS Statistics 29. Before analysis, data were downloaded from Qualtrics and the m-Path platform. The datasets containing pre- and post-measurements, demographic information, and daily measurements were merged to ensure correct alignment across time points and participants. The merged dataset was subsequently imported into SPSS for analysis.

First, a randomization check was conducted using a chi-square test and independent sample t-test to ensure that the two groups were similar and thus comparable (see Appendix B). Descriptives of all variables were obtained. A correlation matrix was conducted to identify correlations. Before the main analysis, assumptions were checked and met (see Appendix B). Hypothesis 1 was tested using multiple linear regression to examine the relationship between PF and DS, controlling for gender and age. Hypotheses 2 and 3 were tested using a moderated regression analysis. The model included Condition (GJ, DD), DS, as well as their interaction term (DS x Condition) to test for moderation, controlling for gender, age, and PF before the intervention. The main effect of the Condition was used to test Hypothesis 2, assessing whether PF increased significantly more in the gratitude condition compared to the DD condition. The interaction term tested Hypothesis 3, evaluating whether the relationship between GJ and PF was moderated by DS. In addition, two exploratory analyses were conducted.

Results

Descriptive Statistics

Table 2 displays the means, standard deviations, and intercorrelations for the main study variables, i.e., DS (at baseline), PF-pre (PF before the intervention), and PF-post (PF after the intervention. Table 3 summarizes descriptive statistics for each experimental condition (GJ, DD), including the mean scores and standard deviations for PF-pre, PF-post, and DS.

Table 2

Means, standard deviation, and correlations between variables PF-pre, PF-post, and Depressive Symptoms,

Variable	*M*	*SD*	1	2	3
1. DS	11.20	7.47	-		
2. PF-pre	40.87	9.11	-.318	-	
3. PF-post	44.1	8.17	-.27	0.68	-

**p < .05

Note. N= 58. M = mean scores. SD = standard deviation. PF-pre = psychological flexibility before the Intervention. PF-post = psychological flexibility after intervention. DS= depressive symptoms

Table 3

Descriptives of the included Measures in the Analysis per Condition

Condition		PF-pre	PF-post	DS
Gratitude Journaling	Mean	40.09	43.1935	12.06
	N	31	31	31
	SD	10.06	8.65	8.38
Digital Diary	Mean	41.77	45.14	10.22
	N	27	27	27
	SD	7.98	7.6	6.28
Total	Mean	40.87	44.1	11.20
	N	58	58	58
	SD	9.11	8.17	7.47

Note. N= 58. N = number of participants

Hypothesis testing

Hypothesis 1: Multiple Linear Regression

A multiple linear regression was performed to examine the relationship between PF (IV) and DS (DV) before the Intervention, controlling for gender and age.

The results showed that PF significantly predicted DS (β= -.330, SE= .108, $p < .05$), with higher levels of PF being associated with lower levels of DS. Gender, used as a control variable, was no significant predictor (*β = –.082, SE = 1.93, p = .525)*. In contrast, age was significant (*β= -.281, SE= .396,* $p < .05$).

The overall regression model was statistically significant, $F(3, 53) = 3.54$, $p < .05$), indicating that the combination of PF and the control variables (gender, age) explained a significant proportion of the variance in DS. The Model accounted for 16.7% of the variance in depression scores ($R^2 = .167$, Adjusted $R^2 = .120$).

Hypothesis 2 and 3: Moderated Regression Analysis

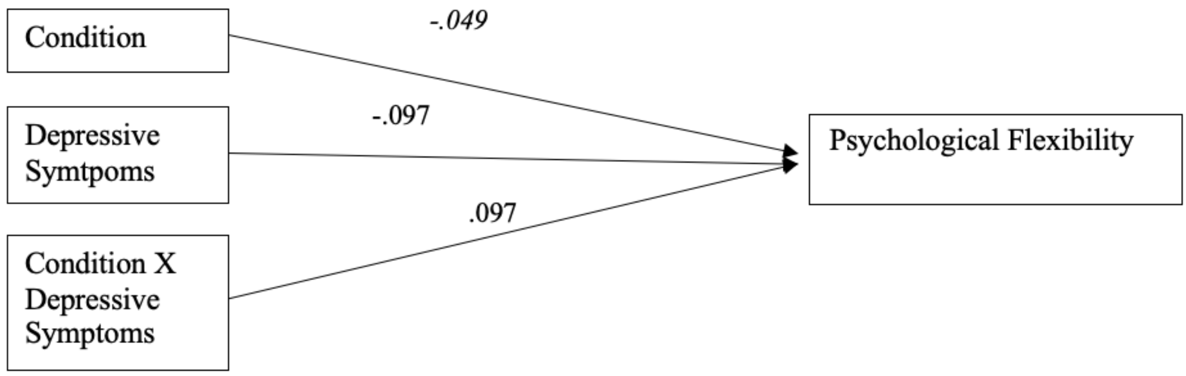
A moderated linear regression analysis was conducted to examine the relationship between Condition (IV), DS, PF (DV), and their interactions. Gender, PF-pre, and age were included as control variables. Figure 3 shows the statistical model for moderation, including the interaction between Condition and DS (H3). Figure 4 shows the effect of Condition on PF (H2).

The results revealed that neither Condition (β = -.048, SE = 3.03, p = .807) nor DS (β = -.068, SE= .144, p = .62) had a significant direct effect on PF. Among the control variables, PF pre-measurement showed a significant effect on PF (β = .643, SE = .10, $p < .001$). In contrast, gender (β= -.086, SE= 1.74, p = .43) and age showed no significant effect on PF (β = .091, SE = 365, p = 42). Additionally, the interaction term between DS and condition was not statistically significant (β = .092, SE= .239, p = .65), indicating that the interaction term did not moderate the relationship between GJ and PF.

The overall regression model was statistically significant, $F(6, 50) = 6.85$, $p < .001$, indicating that the combination of condition, DS, their interaction, and control variables (age, gender, PF-pre) explained a significant proportion of PF. The model accounted for 45.1% of the variance in PF (R^2 = .451, Adjusted R^2 = .385).

Figure 3:

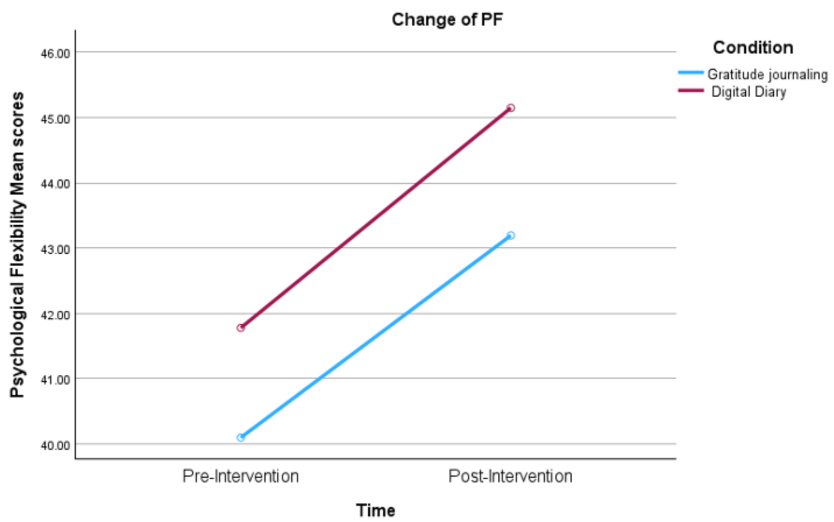
Statistical Diagram of the Moderation Model



Note. Total N= 58

Figure 4:

Means Plot Displaying the Change in Psychological Flexibility in Digital Diary (n = 27) vs. Gratitude Journaling (n = 31)



Note: Figure 2 illustrates mean Psychological Flexibility scores before and after the intervention for both conditions (Gratitude Intervention; Digital Diary)

Exploratory Analysis

Gender differences in Depression Baseline scores

To test the exploratory hypothesis that women have significantly higher DS compared to men, an independent sample t-test was conducted. There was no significant effect for gender, $t(55) = 0.107$, $p = .915$, 95% CI [-3.87, 4.3], despite men showing slightly higher mean scores ($M = 11.21$, $SD = 7.1$) compared to women ($M = 11$, $SD = 7.83$).

Predictive Value of Psy-Flex Components

An exploratory multiple regression was conducted to investigate which Psy-Flex components best predicted DS. The overall model was marginally non-significant, $F(6, 51) = 2.26$, $p = .052$. While none of the predictors reached significance, Defusion ($\beta = –.280$, $SE = .631$, $p = .104$) and Values ($\beta = –.313$, $SE = .625$, $p = .076$) showed the strongest negative associations with DS.

Discussion

This study aimed to investigate the effectiveness of a 10-day GJ intervention via M-path to enhance PF in young professionals and examined whether DS moderated this relationship. In addition, the study explored potential gender differences in baseline DS and tested individual associations between the six Psy-Flex components and DS. The findings partially supported the hypotheses. PF negatively predicted DS, supporting H1. In contrast, the GJ intervention did not lead to a significantly greater increase in PF compared to the DD group, deviating from H2. Besides, DS did not significantly moderate the relationship between GJ and PF, contradicting H3.

The results of the analysis suggest that PF had a significant negative effect on DS, indicating that higher levels of PF are associated with lower levels of DS. The results confirm the first hypothesis and align with previous research highlighting the importance of PF for mental health (Bryan et al., 2015; Kashdan & Rottenberg, 2010). According to Fonseca et al. (2019), PF can function as a protective factor against the negative effects of external and internal life stressors that contribute to the onset and persistence of DS. This is because individuals with higher PF can adapt to challenging circumstances and internal experiences by being in contact with the present moment in an accepting and non-judging way instead of suppressing them (Bryan et al., 2015; Fonseca et al., 2019; Hayes et al., 2012. In contrast, a lack of PF, often observed in depressed people, leads to unhelpful thought patterns such as rumination and negative self-perception (Fledderus et al., 2012; Kashdan & Rottenberg, 2010). Taken together, these findings suggest that PF is an important focus for interventions aiming to prevent depression and promote well-being.

To explore which Psy-flex item has the highest association with DS, a multiple regression was conducted. Although non-significant, the results suggest that PF components “Values” (chosen qualities of purposive action) and “Defusion” (creating contexts in which the function of unhelpful cognitions is diminished) have the highest predictive value for DS (Gloster et al., 2021). The findings are not surprising, given that depression is characterized by ruminating and value deviation (Nolen-Hoeksema et al., 2008; Tunç et al., 2023). This indicates that intervention targeting these components of PF can be especially beneficial for people showing DS.

Another exploratory analysis revealed no significant gender difference in DS. These results are in contrast to past research, suggesting that depression rates are significantly higher in women than in men (Salk et al., 2017; Goebert et al., 2009). Hyde (2005) provides one possible explanation with his gender similarity hypothesis, suggesting that contextual variables can outweigh gender differences in psychological outcomes. The relatively homogeneous sample in the present study likely shared social roles, environments, and stressors, potentially reducing gender differences.

The second hypothesis was not supported as GJ did not lead to a significantly greater increase in PF than the DD condition. Although PF slightly increased after the GJ intervention (mean change =3.224, SD = 6.935), the change was minimal and not significantly different compared to the DD condition. While no prior studies have directly examined the effect of GJ on PF, there is an extensive amount of research supporting the broad benefits of GJ (Emmons & McCullough, 2003; Işık & Ergüner-Tekinalp, 2017; Wood et al., 2010). Given these findings and the strong link between PF and mental health (Lucas & Moore, 2019), a stronger effect on PF was expected.

A possible explanation is that GJ alone might not be sufficient to effectively improve PF. Keeping a gratitude journal leads one to focus on positive experiences and recognize the good in life (Sansone & Sansone, 2010; Wood et al., 2010). However, GJ does not directly train or target components of PF such as accepting both positive and negative experiences, detachment from thought, being in the present moment, and the ability to act in line with one's values (Hayes et al., 2011). The ACT framework suggests interventions that include mindfulness training, meditation, cognitive defusion techniques, value identification, and breathing exercises, which have been proven to enhance PF (Levin et al., 2012). GJ, on the other hand, does not include such elements, which could explain insignificant findings.

Furthermore, a potential ceiling effect might have limited observable changes in PF. As shown by Simkovic & Träuble (2019), ceiling effects can mask true changes by restricting score variability and reducing the likelihood of detecting statistically significant differences. The sample showed relatively high baseline PF scores, leaving limited room for improvement.

Additionally, more than half of the sample (n = 32, 55.2%) had no prior experience with GJ. Identity-based motivation theory suggests that people are more likely to engage with and benefit from identity-congruent actions. In contrast, interventions that are not identity-congruent lead to reduced motivation and perception of relevance (Oyserman & Destin, 2010). For participants with no prior experience, the intervention may have felt unfamiliar and misaligned with their identity, thereby reducing perceived relevance and its effectiveness.

The results must be considered in light of duration and timing, potentially limiting the intervention's effectiveness. It could be that a 10-day intervention is too short to induce improvements in PF. Research on ACT-based interventions indicates a dose-response relationship, where more sessions and longer durations are associated with stronger and more lasting effects (Levy et al., 2020). In addition, the intervention ended just two days before Christmas, adding additional stressors that could have limited participants' engagement (Greenberg Quinlan Rosner, 2006; Mutz, 2015).

Another important consideration is that answering the daily measurements (stress levels, PF, well-being, and physical activity) on m-path involves self-reflection, which in itself could have therapeutic effects. Self-reflection increases meaning in life, well-being, and adaptive coping (Czyżowska & Gurba, 2021). Consequently, it is unclear whether the improvements in PF were due to GJ or the reflection process embedded in the assessments. Future studies should minimize additional questionnaires to control for self-reflective effects, isolating the unique effects of the intervention.

The study was not able to find a significant moderation effect of DS on the relationship between GJ and PF. Specifically, there was no significant evidence to support the hypothesis (H3) that individuals with higher levels of DS would experience more improvements in PF compared to individuals with lower levels. Given the sample characteristics, these findings should be interpreted with caution. According to the DASS-21 categorization, the majority of participants reported low to mild DS (65.5% with DASS-21 scores between 0–14), while only a small subset (10.3%) reported severe to extremely severe symptoms (DASS-21 scores ≥ 21). Harbaugh and Vasey (2014) demonstrated that the moderation effects of DS are often detectable only at higher severity levels. Therefore, the extremely low representation of people with greater DS scores might have reduced the capacity to find a moderating effect. A more balanced sample would be needed to detect significant effects.

Moreover, when examining the data in the GJ condition, it becomes visible that participants with moderate to severe DS (DASS-21 scores ≥ 14) showed a larger mean improvement in PF (M = 3.67, SD=2.7) compared to those with mild or no DS (DASS-21 scores ≤ 13; M = 2.7, SD= 6.0). Although statistically insignificant, this trend aligns with previous findings suggesting people with depression can benefit more from such interventions (Harbaugh & Vasey, 2014; Sin & Lyubomirsky, 2009). This could be because GJ can help to counteract the negative emotional recall tendencies, a key factor in depression (Harbugh & Vasey, 2014). Nevertheless, given the insignificant results and the limited and contradictory research about the moderating role of DS in GI, the relationship remains unclear, and no conclusion can yet be drawn (Cregg & Cheavens, 2020; Harbaugh & Vasey, 2014).

Apart from the previously mentioned weaknesses of this study, such as duration, timing, and low DS levels, the current study has several limitations that must be addressed. First, self-report measures can be vulnerable to response biases, such as social desirability, causing participants to exaggerate or underreport their perceived PF and DS scores because they were concerned about their scores (Rosenman et al., 2011). Moreover, the predominantly white sample (81%) limits the generalisability of the findings. Another limitation is the lack of control for trait gratitude, a factor that has been proven to moderate the effectiveness of GI (Oltean et al., 2022; Rash et al., 2011). A further limitation relates to the modified Psy-Flex scale. Originally assessing PF based on a 7-day reflection period, the time frame was shortened to 2 hours in this study to allow for momentary assessment. This methodology adjustment may have reduced its reliability and comparison with earlier research that used the standard version. Lastly, a prior power analysis revealed that a sample size of N= 166 would have been necessary for sufficient statistical power. Thus, non-significant findings should be interpreted with caution due to the small sample size of 58 participants.

Strengths

The presented study has several notable strengths. First, it fills a significant research gap by being the first to investigate the effects of GJ on PF, measured using the Psy-Flex scale, thereby offering a better understanding of the interplay of GJ, PF, and DS. Moreover, the inclusion of DS as a moderator increased the validity of the study by taking individual differences into account. The use of m-path, both for data collection and intervention delivery, allowed for repeated assessments in a natural setting, reducing recall errors and improving the reliability of self-reported experiences (Mestdagh et al., 2023). Notifications through the app likely increased participant engagement and reduced dropout rates. Finally, GJ is a low-cost, time-efficient method, as it does not require the presence of a trained professional, thus increasing accessibility for individuals with limited access to conventional therapy.

Future directions

This study underscores the need for future research with a refined methodological design to better assess the effectiveness of GJ for PF. Interventions should be conducted during less stressful periods to reduce external influences and should extend over longer periods. To better determine whether the improvements in PF are solely due to the GJ, future studies should isolate the effects of the intervention by avoiding additional daily assessments. Furthermore, trait gratitude should be included as a control variable to account for predispositions that might influence the interventions' effectiveness. To increase reliability and cross-study comparability, future research should apply the original Psy-Flex scale or alternative validated measurements for assessing PF. Moreover, recruiting a more diverse sample is necessary to improve the generalisability of the findings. To detect potential moderators, conducting the study in a sample with severe DS is recommended. Lastly, follow-up assessments would help examine sustainability.

Conclusion

This study sheds light on the relationship between PF, GJ, and DS. PF appears to be an important predictor of DS. However, GJ did not effectively increase PF after the 10-day Intervention compared to the DD. In addition, the study was not able to statistically confirm that DS moderated the relationship between GJ and PF. Although the findings are inconclusive, the study contributes to a novel research direction in exploring GJ as a strategy to enhance PF. The findings suggest that GJ might not be the most suitable approach for targeting PF. However, future studies should address the study's limitations to gain more insight into how GJ might be used as a cost-effective intervention for enhancing PF.

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Appendix A

Data collection contribution

I created the information letter and advertised the study, including writing texts and designing material for recruitment. Active recruitment included reaching out to friends, students from my old bachelor's program, and students from the master's program. Since the m-path platform was new for everyone involved, I worked together with two other students to figure out how the app works. This included learning how to insert questionnaires and scales and how to set up notifications so that participants would receive daily prompts. In addition, I was responsible for keeping an overview of all the daily measures, making them ready and accessible, and deciding on the exact timeframes of the check-ins. I conducted 22 video briefings with participants, each lasting between 10 to 20 minutes, where I explained the setup of the m-path app and answered questions. Additionally, I was responsible for the onboarding of those 22 participants into m-path and monitoring their setup. I also downloaded the responses from the m-path platform and inserted them into our documents for further analysis. We also had many group meetings during the preparation phase, where we discussed and developed the study concept together.

Appendix B

Preliminary analyses

Randomization Check

Chi-square tests were performed to confirm successful randomization across demographic variables in the two experimental conditions. No significant differences were found between the conditions based on gender ($\chi^2(2, N = 58) = 2.185, p = .335$), young professional status ($\chi^2(2, N = 58) = 0.260, p = .878$), and race ($\chi^2(5, N = 58) = 7.352, p = .196$). Additionally, an independent samples t-test was conducted to examine potential age differences, revealing no significant difference across conditions ($t(56) = -0.619, p = .538$).

To further ensure randomization success, independent samples t-tests were conducted on key variables. No significant differences were found between conditions for DS at baseline ($t(56) = 0.935, p = .354$) or for psychological flexibility post-intervention ($t(56) = -0.907, p = .368$) These results suggest that randomization was successful in creating two groups without significant differences in demographic characteristics or key variables relevant to the analysis.

Assumptions:

H1:

Assumptions for regression were carefully checked before analysis. Multicollinearity was checked using Variance Inflation Factors, with values of **1.03, 1.03, and 1.01** for the predictors, well below the cutoff of 5, suggesting no problem. Homoscedasticity was examined using a scatterplot of the residuals, showing that the residuals spread evenly across the range of predicted values. The independence of residuals was assessed using the Durbin-Watson statistic, with values between **1.5 and 2.5** indicating no autocorrelation (Durbin-Watson value of **1.7)**. The normality of residuals was assessed using a Predicted Probability (P-P)-Plot where the residuals aligned closely with the plot's diagonal line. Since the residuals are normally distributed and exhibit homoscedasticity, linearity holds. However, when examining scatterplots of each predictor against the dependent variable, there was a very weak linear relationship with the dependent variable PF. The analysis was carried out while acknowledging this limitation.

H2:

Assumptions for regression were carefully checked before analysis. Multicollinearity was checked using Variance Inflation Factors, with values of **1.7, 3.4, and 3.76, 1.1, 1.12, 1.1** for the predictors, well below the cutoff of 5, suggesting no problem. Homoscedasticity was examined using a scatterplot of the residuals, showing that the residuals spread evenly across the range of predicted values. The independence of residuals was assessed using the Durbin-Watson statistic, with values between **1.5 and 2.5** indicating no autocorrelation (Durbin-Watson value of **1.9)**. The normality of residuals was assessed using a Predicted Probability (P-P)-Plot where the residuals aligned closely with the plot's diagonal line. Since the residuals are normally distributed and exhibit homoscedasticity, linearity holds. However, when examining scatterplots of each predictor against the dependent variable, only PF at baseline had a strong linear relationship, all the other predictors showed a very weak linear relationship with the dependent variable PF. The analysis was carried out while acknowledging this limitation.

Appendix C

Analysis: Syntax SPSS

Total Score PF Baseline:

```
COMPUTE Psy_flex_pre=Pre_moment_awareness + Pre_acceptance + Pre_Defusion + Pre_stableself
+  Pre_values + Pre_comm_action.
EXECUTE.
```

Total Score PF post-measurement:

```
COMPUTE Psy_flex_Post=Post_presentmoment + Post_acceptance + Post_defusion +
Post_selfawareness +
    + Post_values + Post_comm_action.
EXECUTE.
```

Dass-21 Depression score Baseline:

```
COMPUTE Depression=(ITEm3pre + ITEm5pre + ITEm10pre + ITEM13Pre + ITEM16pre +
ITEM17pre +
    ITEM21pre) * 2.
EXECUTE.
```

Correlation table:

```
CORRELATIONS
  /VARIABLES=Condition Depression_pre PoST_PF Interaction PRE_PF
Gratitude_experience_coded
  /PRINT=TWOTAIL NOSIG FULL
  /MISSING=PAIRWISE.
```

Computing interaction term:

```
COMPUTE Interactionterm=Condition * Depression.
EXECUTE.
```

Coding Gender

```
RECODE Gender ('Man'=1) ('Woman'=2) INTO Gendercoded.
EXECUTE.
```

Data inspection

Descriptive: age, depressive symptoms, PF Baseline, PF-post

```
DESCRIPTIVES VARIABLES=Psy_flex_pre Psy_flex_Post Depression Age
  /STATISTICS=MEAN STDDEV MIN MAX.
```

Frequency: Race, gender, age, young professional, gratitude experience

```
FREQUENCIES VARIABLES=Race Gender Age Young_Professioanals Gratitude_experience
  /ORDER=ANALYSIS.
```

Reliability analysis:

Reliability of PF

```
  /VARIABLES=Pre_moment_awareness Pre_acceptance Pre_Defusion Pre_stableself Pre_values
    Pre_comm_action
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA.
```

Reliability of DS

```
  /VARIABLES=ITEm3pre ITEm5pre ITEm10pre ITEM13Pre ITEM16pre ITEM17pre ITEM21pre
```

```
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA.
```

H1

```
GUIDE: axis(dim(1), label("PoST_PF"))
  GUIDE: axis(dim(2), label("Depression_pre"))
  GUIDE: text.title(label("Scatter Plot of Depression_pre by PoST_PF"))
  ELEMENT: point(position(PoST_PF*Depression_pre))
END GPL.


* Chart Builder.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=Age Depression_pre
MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=YES SUBGROUP=NO.
BEGIN GPL
  GUIDE: axis(dim(1), label("Age"))
  GUIDE: axis(dim(2), label("Depression_pre"))
  GUIDE: text.title(label("Scatter Plot of Depression_pre by Age"))
  ELEMENT: point(position(Age*Depression_pre))
END GPL.


REGRESSION
  /MISSING LISTWISE
```

```
 /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
 /CRITERIA=PIN(.05) POUT(.10) TOLERANCE(.0001)
 /NOORIGIN
 /DEPENDENT Depression_pre
 /METHOD=ENTER PRE_PF Gender_c Age
 /SCATTERPLOT=(*ZRESID ,*ZPRED)
 /RESIDUALS DURBIN NORMPROB(ZRESID).
```

H2&3

```
* Chart Builder.
GGRAPH
 /GRAPHDATASET NAME="graphdataset" VARIABLES=Depression_pre PoST_PF
MISSING=LISTWISE
   REPORTMISSING=NO
 /GRAPHSPEC SOURCE=INLINE
 /FITLINE TOTAL=YES SUBGROUP=NO.
BEGIN GPL
 GUIDE: axis(dim(1), label("Depression_pre"))
 GUIDE: axis(dim(2), label("PoST_PF"))
 GUIDE: text.title(label("Scatter Plot of PoST_PF by Depression_pre"))
 SCALE: linear(dim(2), include(0))
 ELEMENT: point(position(Depression_pre*PoST_PF))
END GPL.
```

```
* Chart Builder.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=PRE_PF PoST_PF
MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=YES SUBGROUP=NO.
BEGIN GPL
  GUIDE: axis(dim(1), label("PRE_PF"))
  GUIDE: axis(dim(2), label("PoST_PF"))
  GUIDE: text.title(label("Scatter Plot of PoST_PF by PRE_PF"))
  ELEMENT: point(position(PRE_PF*PoST_PF))
END GPL.
* Chart Builder.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=Condition PoST_PF
MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=YES SUBGROUP=NO.
BEGIN GPL
  GUIDE: axis(dim(1), label("Condition"))
  GUIDE: axis(dim(2), label("PoST_PF"))
  GUIDE: text.title(label("Scatter Plot of PoST_PF by Condition"))
  SCALE: linear(dim(2), include(0))
  ELEMENT: point(position(Condition*PoST_PF))
END GPL.
* Chart Builder.
```

```
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=Interaction PoST_PF
MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=YES SUBGROUP=NO.
BEGIN GPL
  GUIDE: axis(dim(1), label("Interaction"))
  GUIDE: axis(dim(2), label("PoST_PF"))
  GUIDE: text.title(label("Scatter Plot of PoST_PF by Interaction"))
  SCALE: linear(dim(2), include(0))
  ELEMENT: point(position(Interaction*PoST_PF))
END GPL.
* Chart Builder.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=Age PoST_PF
MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=YES SUBGROUP=NO.
BEGIN GPL
  GUIDE: axis(dim(1), label("Age"))
  GUIDE: axis(dim(2), label("PoST_PF"))
  GUIDE: text.title(label("Scatter Plot of PoST_PF by Age"))
  ELEMENT: point(position(Age*PoST_PF))
END GPL.
* Chart Builder.
GGRAPH
```

```
  /GRAPHDATASET NAME="graphdataset" VARIABLES=Gender_c PoST_PF
MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=YES SUBGROUP=NO.
BEGIN GPL
  GUIDE: axis(dim(1), label("Gender_c"))
  GUIDE: axis(dim(2), label("PoST_PF"))
  GUIDE: text.title(label("Scatter Plot of PoST_PF by Gender_c"))
  SCALE: linear(dim(2), include(0))
  ELEMENT: point(position(Gender_c*PoST_PF))
END GPL.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10) TOLERANCE(.0001)
  /NOORIGIN
  /DEPENDENT PoST_PF
  /METHOD=ENTER Depression_pre Condition Interaction Gender_c PRE_PF Age
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN NORMPROB(ZRESID).
```

Exploratory analysis

Independent-sample t-test

```
EXAMINE VARIABLES=Depression_pre BY Gender_c
```

```
 /PLOT BOXPLOT STEMLEAF HISTOGRAM NPPLOT
 /COMPARE GROUPS
 /STATISTICS DESCRIPTIVES
 /CINTERVAL 95
 /MISSING LISTWISE
 /NOTOTAL.
EXAMINE VARIABLES=Depression_pre BY Gender_c
 /PLOT BOXPLOT STEMLEAF HISTOGRAM NPPLOT
 /COMPARE GROUPS
 /STATISTICS DESCRIPTIVES
 /CINTERVAL 95
 /MISSING LISTWISE
 /NOTOTAL.



* Chart Builder.
GGRAPH
 /GRAPHDATASET NAME="graphdataset" VARIABLES=Gender_c Depression_pre
MISSING=LISTWISE
   REPORTMISSING=NO
 /GRAPHSPEC SOURCE=INLINE.
BEGIN GPL
 DATA: id=col(source(s), name("$CASENUM"), unit.category())
 GUIDE: axis(dim(1), label("Gender_c"))
```

```
  GUIDE: axis(dim(2), label("Depression_pre"))
  GUIDE: text.title(label("Simple Boxplot of Depression_pre by Gender_c"))
  SCALE: linear(dim(2), include(0))
  ELEMENT: schema(position(bin.quantile.letter(Gender_c*Depression_pre)), label(id))
END GPL.


T-TEST GROUPS=Gender_c(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Depression_pre
  /ES DISPLAY(TRUE)
  /CRITERIA=CI(.95).
```

Multiple linear regression

```
* Chart Builder.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=Pre_Defusion Depression_pre
MISSING=LISTWISE
    REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=YES SUBGROUP=NO.
BEGIN GPL
  GUIDE: axis(dim(1), label("Pre_Defusion"))
  GUIDE: axis(dim(2), label("Depression_pre"))
  GUIDE: text.title(label("Scatter Plot of Depression_pre by Pre_Defusion"))
  ELEMENT: point(position(Pre_Defusion*Depression_pre))
END GPL.
```

```
* Chart Builder.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=Pre_values Depression_pre
MISSING=LISTWISE
    REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE
  /FITLINE TOTAL=NO SUBGROUP=NO.
BEGIN GPL
  GUIDE: axis(dim(1), label("Pre_values"))
  GUIDE: axis(dim(2), label("Depression_pre"))
  GUIDE: text.title(label("Scatter Plot of Depression_pre by Pre_values"))
  ELEMENT: point(position(Pre_values*Depression_pre))
END GPL.
```

Standardized Residual Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

     1.00       -1 .  6
     8.00       -1 .  00011334
    10.00       -0 .  5556677888
    14.00       -0 .  00001122233344
     9.00        0 .  000112234
     7.00        0 .  6666799
     5.00        1 .  01222
     2.00        1 .  57
     1.00        2 .  4
     1.00 Extremes    (>=2.6)
```

Stem width: 1.00000

Each leaf: 1 case(s)

```
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10) TOLERANCE(.0001)
  /NOORIGIN
  /DEPENDENT Depression_pre
  /METHOD=ENTER Pre_moment_awareness Pre_acceptance Pre_Defusion Pre_stableself
Pre_values
    Pre_comm_action
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID)
  /SAVE RESID.
```

Comparing improvement for different dass scores:

```
COMPUTE filter_$=(Condition = 0 AND Depression_DASS = 1).
VARIABLE LABELS filter_$ 'Condition = 0 AND Depression_DASS = 1 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.
T-TEST PAIRS=PRE_PF WITH PoST_PF (PAIRED)
  /ES DISPLAY(TRUE) STANDARDIZER(SD)
  /CRITERIA=CI(.9500)
```

```
  /MISSING=ANALYSIS.

USE ALL.
COMPUTE filter_$=(Condition = 0 AND Depression_DASS = 2).
VARIABLE LABELS filter_$ 'Condition = 0 AND Depression_DASS = 2 (FILTER)'.
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.
FORMATS filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE.
T-TEST PAIRS=PRE_PF WITH PoST_PF (PAIRED)
  /ES DISPLAY(TRUE) STANDARDIZER(SD)
  /CRITERIA=CI(.9500)
  /MISSING=ANALYSIS.
```

Appendix D

Measurements

Demographic questions

Item	Response options
Involvement in student activism 1. Are you currently involved in any form of activism? (This may include social media activism, attending protests, organizing events, donating, or other forms of support/solidarity.) o Yes o No 2. If “Yes” -> What types of activism have you been involved in or are currently engaged in? (Select all that apply) o Attending protests o Social media activism o Donating to causes o Fundraising o Solidarity actions o Organizing events o Involvement in groups focused on activism (e.g., Amnesty International) o Other: ________ 3. Which causes are you interested in advocating for? (We recognize the intersectionality of these issues, so please select as many as apply. This is just for us to get a general idea.) o Human suffering/war o Climate crisis o Housing crisis o Student-related activism (e.g., budget cuts in higher education) o Feminism o LGBTQIA+ rights o Other: ___________ 4. (For people that clicked human suffering/war) Which situations involving human suffering, war and/or genocide are you advocating for? (Again, the same intersectionality of issues applies, thus choose as many as apply) o Palestine o Lebanon o Sudan o Congo o Ukraine o Other ____ 5. Is there anything else about your activism that you think is important for us to know? o open box	
Which gender do you identify with? • male • female • nonbinary • cisgender • transgender • gender neutral • Other ____	
Which race or ethnicity best describes you? (multiple choice) • American Indian or Alaskan Native • Asian/ Pacific Islander • Black or African American • Hispanic • White/ Caucasian	

• Multiple ethnicity • Other	
What best describes your current occupation? (multiple choice) • Student • Working Student • Working • Unemployed	
How old are you? (Open field response)	
Do you have experience in gratitude journaling? • No • Yes, I did gratitude journaling in the past. • Yes, I am currently regularly doing gratitude journaling.	
Physical activity: 1. On the days you engage in physical activity, how much time do you spend doing it? • Less than 30 minutes • 30-60 minutes • 60-90 minutes • more than 90 minutes 2. How would you describe your usual physical activity? • Light (e.g. walking, stretching) • Moderate (e.g. cycling, hiking) • Vigorous (e.g. running, swimming, HIIT))	

Pre and Post Measurement

Item	Response options
DASS-21	
1 (s) I found it hard to wind down	for all items: 4-point-scale (0 = "did not apply to me" to 3 = "applied to me very much most of the time")
2 (a) I was aware of dryness of my mouth	"
3 (d) I couldn't seem to experience any positive feeling at all	"
4 (a) I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	"
5 (d) I found it difficult to work up the initiative to do things	"
6 (s) I tended to over-react to situations	"
7 (a) I experienced trembling (e.g. in the hands)	"
8 (s) I felt that I was using a lot of nervous energy	"
9 (a) I was worried about situations in which I might panic and make a fool of myself	"
10 (d) I felt that I had nothing to look forward to	"
11 (s) I found myself getting agitated	"
12 (s) I found it difficult to relax	"
13 (d) I felt down-hearted and blue	"
14 (s) I was intolerant of anything that kept me from getting on with what I was doing	"
15 (a) I felt I was close to panic	"
16 (d) I was unable to become enthusiastic about anything	"
17 (d) I felt I wasn't worth much as a person	"
18 (s) I felt that I was rather touchy	"
19 (a) I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	"
20 (a) I felt scared without any good reason	"
21 (d) I felt that life was meaningless	"

	" " " " " " " " " " " "
Mental Health Continuum Short Form https://peplab.web.unc.edu/wp-content/uploads/sites/18901/2018/11/MHC-SFoverview.pdf During the past month, how often did you feel ... 1. happy 2. interested in life 3. satisfied with life 4. that you had something important to contribute to society 5. that you belonged to a community (like a social group, or your neighborhood) **SEE BELOW 6. that our society is a good place, or is becoming a better place, for all people** 7. that people are basically good 8. that the way our society works makes sense to you 9. that you liked most parts of your personality 10. good at managing the responsibilities of your daily life 11. that you had warm and trusting relationships with others 12.that you had experiences that challenged you to grow and become a better person 13. confident to think or express your own ideas and opinions 14. that your life has a sense of direction or meaning to it	Please answer the following questions are about how you have been feeling during the past month. Place a check mark in the box that best represents how often you have experienced or felt the following: Never Once or twice About once a week About 2 or 3 times a week Almost every day Every day
Gratitude Questionnaire Six Item Short Form https://ggsc.berkeley.edu/images/uploads/The_Gratitude_Questionnaire.pdf ____1. I have so much in life to be thankful for. ____2. If I had to list everything that I felt gr ateful for, it would be a very long list. ____3. When I look at the world, I don't see much to be grateful for. ____4. I am grateful to a wide variety of people. ____5. As I get older I find myself more able to appreciate the people, events, and situations that have been part of my life history. ____6. Long amounts of time can go by before I feel grateful to something or someone.	Instructions: Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it. 1 = strongly disagree 2 = disagree 3 = slightly disagree 4 = neutral 5 = slightly agree 6 = agree 7 = strongly agree

Pre- and Post-measurments :

Item	Response options
DASS-21 1 (s) I found it hard to wind down 2 (a) I was aware of dryness of my mouth 3 (d) I couldn't seem to experience any positive feeling at all	for all items: 4-point-scale (0 = "did not apply to me" to 3 = "applied to me very much most of the time") " "

4 (a) I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion) 5 (d) I found it difficult to work up the initiative to do things 6 (s) I tended to over-react to situations 7 (a) I experienced trembling (e.g. in the hands) 8 (s) I felt that I was using a lot of nervous energy 9 (a) I was worried about situations in which I might panic and make a fool of myself 10 (d) I felt that I had nothing to look forward to 11 (s) I found myself getting agitated 12 (s) I found it difficult to relax 13 (d) I felt down-hearted and blue 14 (s) I was intolerant of anything that kept me from getting on with what I was doing 15 (a) I felt I was close to panic 16 (d) I was unable to become enthusiastic about anything 17 (d) I felt I wasn't worth much as a person 18 (s) I felt that I was rather touchy 19 (a) I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat) 20 (a) I felt scared without any good reason 21 (d) I felt that life was meaningless	" "
Mental Health Continuum Short Form https://peplab.web.unc.edu/wp-content/uploads/sites/18901/2018/11/MHC-SFoverview.pdf During the past month, how often did you feel ... 1. happy 2. interested in life 3. satisfied with life 4. that you had something important to contribute to society 5. that you belonged to a community (like a social group, or your neighborhood) **SEE BELOW 6. that our society is a good place, or is becoming a better place, for all people** 7. that people are basically good 8. that the way our society works makes sense to you 9. that you liked most parts of your personality 10. good at managing the responsibilities of your daily life 11. that you had warm and trusting relationships with others 12.that you had experiences that challenged you to grow and become a better person 13. confident to think or express your own ideas and opinions 14. that your life has a sense of direction or meaning to it	Please answer the following questions are about how you have been feeling during the past month. Place a check mark in the box that best represents how often you have experienced or felt the following: Never Once or twice About once a week About 2 or 3 times a week Almost every day Every day
Psychological Flexibility The following questions refer to your experiences in the last two hours.	10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much")

1. Even if I am somewhere else with my thoughts, I can focus on what's going on in important moments. 2. If need be, I can let unpleasant thoughts and experiences happen without having to get rid of them immediately. 3. I can look at hindering thoughts from a distance without letting them control me. 4. Even if thoughts and experiences are confusing me I can notice something like a steady core inside of me. 5. I determine what's important for me and decide what I want to use my energy for. 6. I engage thoroughly in things that are important, useful, or meaningful to me.	10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much")

Daily measurments:

Item	Response options	Timing
Psychological Flexibility The following questions refer to your experiences in the last two hours. 1. Even if I am somewhere else with my thoughts, I can focus on what's going on in important moments. 2. If need be, I can let unpleasant thoughts and experiences happen without having to get rid of them immediately. 3. I can look at hindering thoughts from a distance without letting them control me. 4. Even if thoughts and experiences are confusing me I can notice something like a steady core inside of me. 5. I determine what's important for me and decide what I want to use my energy for. 6. I engage thoroughly in things that are important, useful, or meaningful to me.	10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much") 10-point scale (1 = "not at all" to 10 "very much")	Midday Check-In (e.g., 12:00 PM) & Evening Check-In (e.g., 7:00 PM)
Perceived Level of Stress 1. To what extent have you felt stressed over the last two hours?	10-point scale (1 = "not at all" to 10 "very much")	Midday Check-In (e.g., 12:00 PM) &

		Evening Check-In (e.g., 7:00 PM)
Gratitude Intervention *1. "Name three things you are grateful for." With examples…*	Open answer	Evening Check-In (e.g., 7:00 PM)
Wellbeing "How do you feel right now?	0 (not good at all) to 10 (very good).	
Physical activity "Have you engaged in physical activity today?"	YES/NO	Evening Check-in (e.g., 7:00PM)