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RESEARCH ARTICLE

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Practicing mindfulness can foster monitoring and acceptance after experiencing negative affect

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Abstract

Although being mindful, that is, monitoring and accepting one's present feelings, has been shown to be associated with less current negative affect than distraction, acceptance is less endorsed after experiencing negative affect. Thus, acceptance, although effective, may not be endorsed when it is most needed, leading people to endorse other strategies such as distraction instead. In the present study, we examined whether a monitoring and acceptance induction in a laboratory setting ($N = 258$) and a monitoring and acceptance training in daily life ($N = 125$) increased acceptance (Study 1) and monitoring (Study 2) after experiencing negative affect. We found this to be the case: While participants in the control condition showed a significant negative association between prior negative affect and subsequent monitoring and acceptance, participants in the monitor and acceptance condition did not. Thus, even brief monitor and acceptance training is well suited to increasing the likelihood that individuals can monitor and accept their thoughts and feelings when confronted with strong emotions.

KEYWORDS
acceptance, affect, ambulatory assessment, mindfulness, mindfulness training

1 | INTRODUCTION

A substantial body of evidence shows the importance of regulating one's own (and others') emotions. A meta-analysis based on 306 included experimental comparisons from laboratory research reported that instructing participants to use acceptance, reappraisal, and distraction led to a significant reduction in negative affect compared to control instructions in which participants received no instruction or were not asked to regulate their emotions, whereas rumination led to a significant increase in negative affect (Webb et al., 2012). Similarly, a meta-analysis based on 241 effect sizes from studies that used trait measures of emotion regulation reported that using acceptance and reappraisal less and distraction and rumination more frequently was significantly associated with more depressive symptoms (Aldao et al., 2010). Finally, a recent meta-analysis that reanalysed 12 ambulatory assessment datasets found that the spontaneous use of acceptance was associated with higher positive affect and lower negative affect in daily life, the spontaneous use of distraction was not, while rumination was associated with lower positive affect and higher negative affect (Wenzel & Rowland, 2024). Thus, although the results for some emotion regulation strategies differ depending on the method used to examine them, it is evident that emotion regulation strategies play an important role in the mental health and affective well-being of individuals. However, the last meta-analysis (Wenzel & Rowland, 2024) also showed that acceptance was selected less strongly than distraction when it was

most needed, that is, when participants were experiencing strong negative affect, although acceptance was more effective than distraction in down-regulating negative affect.

Given that acceptance is highly effective but less endorsed during intense negative affect, the question arises as to whether training individuals in acceptance would improve emotion regulation. One way to practice acceptance is through mindfulness exercises, which involve nonjudgmental monitoring of current experience (e.g., Kabat-Zinn, 1994). While monitoring is a precursor to acceptance, it does not necessarily lead to more acceptance (Lindsay & Creswell, 2017). However, high levels of monitoring have been associated with greater satisfaction with life (Felsman et al., 2017), and monitoring only training has been found to reduce negative affect similarly to combined monitoring and acceptance training (Lindsay et al., 2018). Thus, practicing acceptance alone is challenging because it relates to present-moment experiences. Attention monitoring can occur without explicit acceptance training, but developing an accepting stance requires focusing attention on experiences first (Lindsay et al., 2018). Therefore, we used data from studies that examined the training effects of monitoring and acceptance training.

1.1 | Emotion regulation identification

Emotion regulation can be seen as a dynamic and iterative process with bidirectional links to emotions, in which an emotion regulation effort can influence the emotion, which then triggers additional regulatory acts. In the extended process model of emotion regulation (Gross, 2015), people not only select and attempt to successfully implement an emotion regulation strategy, but must first identify the need for regulation by assessing the current situation and the resulting emotions before activating a goal to influence the trajectory of their emotions, which has been termed emotion regulation identification (Koval et al., 2023). Thus, emotion regulation can be divided into three stages (Gross, 2015): (1) The emotion regulation identification stage, in which the need for emotion regulation is assessed (2) the emotion regulation selection stage, in which an emotion regulation is selected and (3) then the emotion regulation implementation stage, in which emotion regulation is endorsed.

In the present study, we were interested in emotion regulation identification. As argued by Koval et al. (2023), emotion regulation identification depends in part on an appraisal of current emotions. Thus, one way to operationalise emotion regulation identification is to assess the extent to which the selection of emotion regulation strategies depends on prior emotional intensity levels. Using this approach, a recent meta-analysis found that acceptance was selected less and distraction more when individuals felt more negative than positive (Wenzel & Rowland, 2024), which is in line with another study that showed that individuals implement monitoring and acceptance less strongly with increasing levels of negative affect (Wenzel et al., 2020). Thus, while acceptance was more effective in upregulating positive affect and downregulating negative affect than distraction, it is less used in situations that require emotion regulation the most, that is, in situations characterised by intense negative affect. In other words, acceptance might be less strongly implemented with higher levels of negative affect.

1.2 | Emotion regulation identification and depressive symptoms

If acceptance is more effective than distraction, but is used in less intense situations, two questions arise. The first is whether this is a problem. It has been hypothesised that when faced with a stressful situation, individuals may turn to distraction to first cope with intense negative affect before moving on to other strategies, such as reappraisal or acceptance, that help them gain insight from the experience (Ford et al., 2019). However, evidence for this notion is lacking and limited to emotion regulation identification, for example, by showing that distraction is used more in highly intense situations (Sheppes et al., 2011, 2014) because it might be less costly in terms of cognitive resources than reappraisal or acceptance (Troy et al., 2018; Wenzel et al., 2023).

Current studies do not clarify whether individuals shift to reappraisal or acceptance after using distraction. If individuals do not return to the issue after initially avoiding it, they miss out on the insight gained from acceptance, potentially affecting long-term affective well-being and leading to depressive symptoms. Importantly, there is ample evidence that experiential avoidance is associated with mental health issues, particularly with depressive and anxiety symptoms (Akbari et al., 2022).

Conversely, it is also possible that this finding can be explained by individuals with more depressive symptoms tending to use distraction more and acceptance less after experiencing negative affect. To explore this, we examined whether depressive symptoms moderated the relationship between prior negative affect and subsequent use of acceptance and distraction. If depression moderated this relationship, it would suggest that highly depressed individuals might prefer maladaptive emotion regulation strategies. If not, individuals reporting different levels of depression would not differ in how they regulate their affective experiences in everyday life.

1.3 | Emotion regulation identification and mindfulness training

The second question is whether the negative association between current negative affect and subsequent acceptance endorsement is affected by practicing mindfulness, that is, monitoring and acceptance exercises. In mindfulness trainings, people learn to focus on the present moment and to accept even unpleasant experiences (e.g., Kabat-Zinn, 1994; Khoury et al., 2015). Research has shown that mindfulness training does indeed significantly reduce experiential avoidance, which may partially explain the changes in depressive symptoms from baseline to the first follow-up (Yela et al., 2022).

Reduced avoidance may result from increased monitoring of current experiences and greater present-moment awareness when practicing mindfulness. This heightened awareness may provide greater insight into one's emotional life, potentially helping to signal when other emotion regulation strategies, such as reappraisal, are needed (Coffey & Hartman, 2008). In addition, this awareness may allow individuals to decenter from their feelings, thereby reducing reactivity to unpleasant experiences, as has been found in highly anxious individuals with high trait mindfulness (Arch & Craske, 2010). Thus, broadened awareness through monitoring should help individuals adopt a more accepting stance (Desrosiers et al., 2013; Garland et al., 2015). Therefore, monitoring one's feelings may be an important precursor to applying acceptance during intense negative affective experiences. For this reason, we used data from a study that examined how mindfulness training affected monitoring in everyday life (Rowland et al., 2016). Thus, mindfulness training is a promising approach to reduce the negative association between prior negative affect and subsequent monitoring and acceptance, so that individuals may be more likely to focus on the present moment after experiencing negative affect and respond to negative affect more accepting when mindfulness is practiced, which could help them learn from the unpleasant experiences.

1.3.1 | Single session or weekly training of monitoring and acceptance

To first understand whether monitoring and acceptance training does indeed have an effect on the implementation of acceptance after experiencing negative affect, it is helpful to examine the effect of a monitoring and acceptance induction, which is a single short session of monitoring and acceptance training that induces a temporary accepting state in a controlled and standardized setting (Creswell, 2017). In this way, the direct effect of monitoring and acceptance training on the implementation of acceptance can be examined and other influences can be ruled out. However, to further understand whether individuals truly benefit from regular monitoring and acceptance practice in the flow of daily life, which is the goal of well-known mindfulness training such as Mindfulness Based Stress Reduction (Kabat-Zinn, 1990; as opposed to a single session), examining the effects of mindfulness training (which includes not only a single session, but a variety of exercises aimed at improving monitoring and acceptance) on daily life experiences will provide further evidence as to whether consistent monitoring and acceptance practice can help facilitate the implementation of acceptance when experiencing prior negative affect. Given that we used already existing datasets that only assessed the monitoring component of mindfulness in daily life, we also tested whether monitoring and acceptance training helped individuals apply more monitoring after experiencing negative affect in everyday life, which is likely to be an important precursor to the implementation of acceptance (e.g., Desbordes et al., 2015). Thus, combining laboratory and daily life data will help to understand whether training in monitoring and acceptance helps individuals to implement more monitoring and an accepting stance even in the face of highly intense negative affective experiences.

1.4 | The present research

In the present research, we wanted to examine whether practicing mindfulness can foster monitoring and acceptance after experiencing negative affect. Given the clear evidence for experiential avoidance (Akbari et al., 2022), we hypothesised that the higher the depressive symptoms, the stronger the negative association between current negative affect and subsequent monitoring and acceptance endorsement (Hypothesis 1a) and the stronger the positive association with distraction (Hypothesis 1b). In addition, we hypothesised that either a single monitoring and acceptance exercise session or a weekly training would influence the association between current negative affect and subsequent acceptance (or monitoring in Study 2) such that participants in the monitoring and acceptance training condition would have a reduced negative association after training, thereby reducing experiential avoidance, whereas participants in the control condition would not (Hypothesis 2). To test these hypotheses, we reanalysed two datasets, one from a laboratory study that included a single session of a monitoring and acceptance induction (Study 1) and one from an ambulatory assessment study that included a monitoring and accepting training consisting of five weekly sessions and further daily exercises (Study 2), providing high internal and ecological validity.

1.5 | Transparency and openness

We report how we determined our sample size, all data exclusions, manipulations, and measures relevant to the research question of the present studies. The protocol of both studies was approved by the ethics committee of the Department of Psychology at the Johannes Gutenberg University Mainz (reference codes 2021-JGU-psychEK-002 and 2015-JGU-psychEK-011), met all ethical standards laid down in the Declaration of Helsinki (2013), and all participants provided informed consent. Study 1 was pre-registered but for another research question (https://osf.io/ejs5w) and, thus, the present research is exploratory. The data and statistical analyses can be found at OSF (https://osf.io/urtnv).

2 | STUDY 1

2.1 | Method

2.1.1 | Participants and design

Two hundred eighty two recruited participants were pre-registered for the parent study's research question, which assumed an effect

of $d = 0.50$, $\alpha = 0.05$, $1-\beta = 0.95$ and an expected attrition rate of 10% to test the difference between the experimental conditions and the control condition regarding emotional reactivity and recovery. 24 participants did not sign the informed consent and 2 participants dropped out of the experiment, leaving a final sample of 258 participants (204 women, 52 men, 2 unknown/diverse; age: $M = 24.9$ years, $SD = 6.2$; ethnic background: 243 participants were born in Germany, 15 in other countries; education: 246 participants had completed high school, the rest did not). These participants were randomly allocated to the between-subject factor group (control vs. monitoring only (i.e., present moment attention) versus monitoring and acceptance condition) using block randomisation (Schulz & Grimes, 2002). Given that the central hypothesis of the present research (Hypothesis 2) is based on a two-way interaction with $df = 1$, a post-hoc sensitivity analysis using g*Power 3.1 (Faul et al., 2007) revealed a minimal statistically detectable effect size (Lakens, 2022) was $f = 0.19$ (equivalent to $\eta^2 = 0.04$), based on 80% power.

2.1.2 | Procedure

First, informed consent was obtained from all participants. Next, participants provided their sociodemographic information, which was followed by measures of baseline negative affect (t_0). The experimental groups completed the assigned monitoring only or monitoring and acceptance induction. Meanwhile, the control group completed trait questionnaires on mindfulness and social desirability for approximately the duration of the induction. Thereafter, all participants were administered the negative affect questionnaire (t_1). Subsequently, negative affect was induced, using pictures from the standardized Nencki Affective Picture System (Marchewka et al., 2014) based on their valence (1 = *very negative* to 9 = *very positive*). To induce negative affect, all participants were presented with 10 consecutive negative stimuli (valence $M = 2.32 \pm 1.20$, arousal $M = 6.94 \pm 1.30$) for 6000 ms each. Immediately thereafter, negative affect (t_2) was measured again as well as acceptance endorsement while looking at the negative pictures. The experimental groups then completed the trait questionnaires, while the control group received the monitoring and acceptance induction. Finally, a debriefing session took place, after which participants provided consent for the use of their data.

Monitoring and acceptance induction

In a dismantling procedure, we developed a brief guided breathing meditation, which included both monitoring and acceptance instructions. Then, we dismantled the acceptance instructions to obtain a monitoring only induction. As a result, we derived two structurally equivalent inductions, both 4 min in length (see (https://osf.io/urtnv for the instructions). The inductions were delivered online via audio files. When attention was diverted from breathing, participants were instructed to redirect their attention to their breathing. Please note that the dismantling procedure was done for the original research question for which the dataset was collected, not for the hypotheses of this study. In the present study, however, we did not have divergent hypotheses regarding the two monitoring only and the monitoring and acceptance conditions and thus used planned contrasts to compare them with the control condition, using contrasts of 0.5, 0.5, and −1.

2.1.3 | Measures

Acceptance ($M = 5.28$, $SD = 1.31$; item: 'I accepted my feelings about the pictures'.) and distraction ($M = 2.56$, $SD = 1.68$; item: 'I diverted my attention from the pictures'.) were rated on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Negative affect was assessed with four negative activation items (afraid, ashamed, nervous, upset) from the PANAS-SF (Krohne et al., 1996; Watson et al., 1988). These items referred to the current moment, using a response scale that ranged from 1 (*strongly disagree*) to 7 (*strongly agree*), and were assessed before ($M = 1.77$, $SD = 1.00$, $\omega_{between} = 0.85$) and after the affect induction ($M = 3.19$, $SD = 1.40$, $\omega_{between} = 0.82$).

2.1.4 | Analytic approach

The data were prepared and analysed in Stata 17 (College Station, TX, USA: StataCorp LP). For all analyses, we z-standardized continuous variables and used a significance criterion of 0.05.

As preliminary analyses, we examined the effectiveness of acceptance and distraction (i.e., emotion regulation implementation) and the extent to which their selection was predicted by prior negative affect (i.e., emotion regulation identification). For the implementation, we predicted negative affect at t_2 by the main effects of both acceptance and distraction, controlling for negative affect after the monitoring and acceptance induction at t_1 and for the type induction (monitoring only or monitoring and acceptance induction) using dummy variables with the control condition as the base category. For the identification, acceptance and distraction were regressed on prior negative affect at t_1, controlling for the induction.

A test of Hypothesis 1 was only possible in Study 2. To test Hypothesis 2, acceptance and distraction were predicted by the two-way interaction between induction and prior negative affect at t_1.

2.2 | Results and discussion

2.2.1 | Preliminary analyses

Before testing Hypothesis 2 (Hypothesis 1 could only be tested in Study 2), we examined how acceptance and distraction were associated with change in negative affect. The regression model indicated that the four predictors explained $R^2_{adjusted} = 27.2\%$ of the variance in negative affect, $F(5, 252) = 20.21$, $p < 0.001$. While acceptance was associated with decreased negative affect, $\beta = -0.17$, $p = 0.005$, 95%

CI [−0.29, −0.05], distraction was associated with increased negative affect, $\beta = 0.07$, $p = 0.240$, 95% CI [−0.05, 0.19], although only the association of acceptance was significant.

2.2.2 | Hypothesis 2

Next, we tested Hypothesis 2 by predicting either acceptance or distraction by prior negative affect and the monitoring only and monitoring and acceptance conditions and their two-way interaction. The model on acceptance revealed that the predictors explained $R^2_{\text{adjusted}} = 8.4\%$ of the variance in acceptance, $F(5, 252) = 5.69$, $p < 0.001$. The main effect of prior negative affect on subsequent acceptance use was significant, $\beta = -0.19$, $p = 0.003$, 95% CI [−0.31, −0.06], indicating that although acceptance was more effective than distraction in down-regulating negative affect, it was selected significantly less strongly in response to increasing levels of negative affect. The induction also showed a significant main effect on acceptance, $F(2, 252) = 3.26$, $p = 0.040$, $\eta^2_p = 0.03$. Importantly, these main effects were qualified by a two-way interaction between prior negative affect and the induction, $F(2, 252) = 4.43$, $p = 0.013$, $\eta^2_p = 0.04$, which represented the test of Hypothesis 2. As illustrated in Figure 1, higher prior negative affect was significantly associated with lower acceptance selection only in the control condition, $\beta = -0.42$, $p < 0.001$, 95% CI [−0.60, −0.25], but not in the monitoring condition, $\beta = -0.04$, $p = 0.707$, 95% CI [−0.26, 0.17] or in the monitoring and acceptance condition, $\beta = -0.10$, $p = 0.438$, 95% CI [−0.35, 0.15]. A test of planned contrast further corroborated this finding, with a highly significant difference between the slope in the control condition and the mean slope in the two induction conditions, $F(1, 252) = 8.46$, $p < 0.001$, $\eta^2_p = 0.03$.

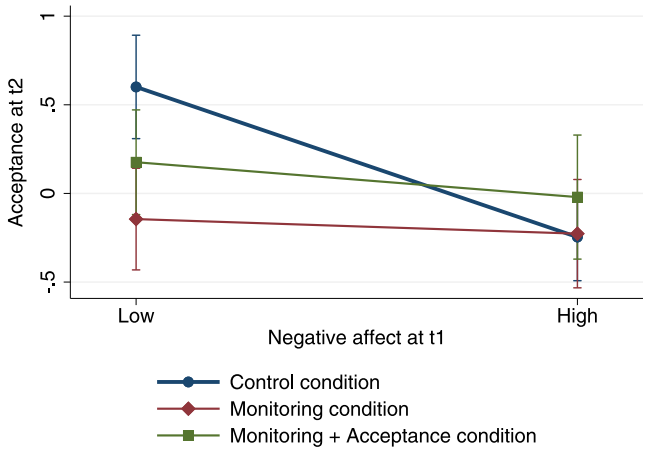

FIGURE 1 Simple slope plot to determine the effect of practicing monitoring and acceptance on the relation between negative affect at t_1 and subsequent acceptance at t_2 in Study 1. The whiskers reflect the 95% confidence intervals.

Finally, we repeated these analyses with distraction as the outcome, which explained $R^2_{adjusted} = 2.6\%$ of the variance in distraction, $F(5, 252) = 2.38$, $p = 0.039$. While acceptance was used significantly less in response to negative affect, distraction was used significantly more, $\beta = 0.13$, $p = 0.039$, 95% CI [0.01, 0.26]. Importantly, unlike for acceptance, the two-way interaction was not significant for distraction, $F(1, 252) = 0.14$, $p = 0.873$, $\eta^2_p = 0.001$. Thus, practicing monitoring only or monitoring and acceptance did not significantly impact the distraction identification in Study 1.

In Study 1, we found that although acceptance was significantly associated with decreases in negative affect, it was selected less strongly in response to strong negative affect. As predicted, we found that this negative association could be reduced to a non-significant association by inducing monitoring and acceptance prior to the emotion regulation situation, providing support for Hypothesis 2. To increase the ecological validity of these findings, we reanalysed the ambulatory assessment data from a randomized controlled trial in Study 2 (Rowland et al., 2016) as a means of conceptual replication.

3 | STUDY 2

3.1 | Method

3.1.1 | Participants

The parent study recruited 137 participants to achieve an a priori power of 95% to detect an effect of Cohen's $d = 0.33$ against $\alpha = 0.05$ and an expected attrition of 10% for the difference between the monitoring and acceptance and control condition in state monitoring. Out of these 137 participants, 11 participants did not complete the study. Additionally, all participants with fewer than 33% completed signals were excluded ($n = 1$) (final $N = 125$; 77.6% female; $M = 22.9$ years, $SD = 5.1$; education: all participants had completed high school; ethnic background: no information was collected). Post-hoc sensitivity analyses using Monte Carlo simulations in Stata based on the estimates for testing Hypothesis 1 revealed a minimal statistically effect size of $\beta = 0.03$ at the within-person level.

3.1.2 | Procedure

The registered parent study (ClinicalTrials.gov: NCT02647801) consisted of a two-armed 6-week randomized controlled, non-blinded trial that was originally designed to evaluate the effects of a brief monitoring and acceptance training (originally called brief mindfulness training) versus a wait-list control condition on monitoring and state self-control in an undergraduate college student population (Rowland et al., 2016), which was effective (Rowland et al., 2019). This study combined a 40-day ambulatory assessment with seven weekly laboratory sessions, which all participants took part in (Rowland et al., 2016, for more information).

Ambulatory assessment

During the first lab session, participants received introduction in the Android applications movisensXS (movisens GmbH, Karlsruhe, Germany), which reminded the participants six times per day over the next 40 days to complete short questionnaires. The signals were randomly distributed between 10 AM and 8 PM, with the contingency that two signals were at least 45 min apart, resulting in a mean interval of $M = 103.4$ min ($SD = 34.3$, Range: 45–200 min). Out of the possible 240 signals, participants completed $M = 182.9$ signals, $SD = 35.3$, on average, yielding an acceptable adherence rate of 76.2%.

Monitoring and acceptance training

Participants of the monitoring and acceptance condition practiced monitoring and acceptance from the second until the sixth laboratory session by completing 12-min computer-based breathing meditation (Levinson et al., 2014). In this task, participants were to guide their attention to their breath by repeatedly counting their breath from one to nine, pressing a specific key from breath one to eight (downward arrow) and for breath nine (right arrow). When shifting away from their breath and miscounting, participants heard a sound that reminded them to focus on their breath again (Levinson et al., 2014) and to nonjudgmentally let their thoughts pass. After each breathing meditation, participants could talk with a research assistant about their experiences during the meditation. Moreover, they were asked to practice monitoring and acceptance at home. To that end, participants could listen to a breathing meditation (11 min) or to a body scan (23 min) on the movisensXS smartphone application. Finally, connecting to MBSR programs (Kabat-Zinn, 1990), participants were asked to practice monitoring and acceptance with an informal mindfulness task, for example, staying mindful when brushing their teeth. For more information regarding home practice and the efficacy of the training, see Rowland et al. (2019).

Participants in the wait-list control condition also returned to the lab each week, where they were filling out questionnaires. After study completion, they had the opportunity to receive all audio files that were used in the monitoring and acceptance condition.

3.1.3 | Measures

Monitoring was assessed via three items from the state version of the Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003) that yielded the highest factor loadings (i.e., items 8, 10, 14 in Brown & Ryan, 2003). Items were rated from 0 (*not at all*) to 6 (*very much*).[1] These items referred to the time period between the current and the last signal ('Since the last signal, …'). The items were inverted to indicate that higher mean MAAS scores reflect higher levels of monitoring. We found good reliability, both at the within-person level, $\omega_{within} = 0.80$, and at the between-person level, $\omega_{between} = 0.96$.

Distraction was also assessed since the last signal by asking the participants: 'Since the last beep, I have distracted my attention away from my feelings'. Participants responded on a scale ranging from 1 (*not at all*) to 7 (*almost all of the time*). Importantly, although distraction and monitoring are conceptually similar, the correlations clearly indicate separate constructs, with $r = -0.12$ at the within-person level and $r = -0.49$ at the between-person level.

Current negative affect was assessed by taking the mean of four emotions (angry, anxious, depressed, and sad). These items referred to the moment of responding to the current signal and ranged from 0 to 100. Reliability was good, $\omega_{within} = 0.71$ and $\omega_{between} = 0.92$.

Depressive symptoms were assessed at baseline before the ambulatory assessment using the WHO-5 Wellbeing Index, showing acceptable reliability, $\omega_{between} = 0.61$. This questionnaire assesses five symptoms on a scale ranging from 0 (*at no time*) to 5 (*all of the time*) and represents a specific and sensitive screening tool for depression (Topp et al., 2015).

3.1.4 | Analytic approach

For all analyses, we computed two-level models, in which observations were nested within participants and in which all continuous predictors were allowed to vary randomly between participants, with the outcome and the continuous predictors being within-person standardized (Wang et al., 2019). Again, we chose a significance criterion of 0.05 for all analyses.

The analytic approach mirrored that of Study 1, adapted to a multilevel framework. For the preliminary analyses, the effectiveness of monitoring and distraction was examined by predicting current negative affect at t by either monitoring or distraction use between t and $t-1$, controlling for prior negative affect at $t-1$.[2] Emotion regulation identification was examined by predicting monitoring or distraction use between t and $t-1$ by prior negative affect at $t-1$, controlling for monitoring or distraction use between $t-1$ and $t-2$. For the test of Hypothesis 1, we added the two-way interaction between prior negative affect at $t-1$ and depressive symptoms at baseline to these two models, using z-standardisation for the person-level variable depressive symptoms. Finally, we tested Hypothesis 2 by predicting monitoring and distraction between t and $t-1$ at the observational level by the three-way interaction of prior negative affect at $t-1$ (i.e., a observational-level/within-person level predictor), the monitoring training (coded as 0 = control condition and 1 = monitoring and acceptance condition, i.e., a person-level predictor), and week (coded as 1–6, i.e., a week-level predictor), including all main effects and two-way interactions, and controlling for monitoring or distraction use between $t-1$ and $t-2$.

In supplementary analyses, we controlled for linear time trends in and across days. However, the results were very similar to the results present here (the full results can be found at https://osf.io/urtnv).

3.2 | Results and discussion

3.2.1 | Preliminary analyses

As shown in Table 1, preliminary analyses indicated that monitoring was effective in down-regulating negative affect, while distraction was not effective. However, although monitoring was more effective

TABLE 1 Current negative affect as a function of monitoring, distraction, and prior negative affect.

Fixed effects	β	p	95% CI
Monitoring	−0.08	<0.001	[−0.10, −0.06]
Distraction	0.15	<0.001	[0.13, 0.18]
Prior negative affect	0.41	<0.001	[0.38, 0.45]
Random effects	**Variance**	**p**	**95% CI**
Monitoring	0.008	<0.001	[0.005, 0.013]
Distraction	0.011	<0.001	[0.007, 0.016]
Prior negative affect	0.031	<0.001	[0.023, 0.041]

than distraction, Table 2 indicates that it was selected significantly less strongly with increasing levels of prior negative affect, while distraction was selected significantly more strongly. In addition, all random effects were significant, indicating significant variance in the slopes. While the random effects seem to be very small, for example, 0.008 for monitoring in Table 1, this means that approximately 95% of the participants' slopes fell between $\beta = -0.25$ and $\beta = 0.10$ ($-0.08 \pm 1.96 \times\sqrt{0.008}$) of the typical effect of monitoring on current negative affect (i.e., fixed effect).

3.3 | Hypothesis 1

Table 2 shows that selecting monitoring after experiencing negative affect was significantly moderated by depressive symptoms, providing support for Hypothesis 1a. Simple slope analyses revealed that the link between monitoring between t and $t-1$ and prior negative affect at $t-1$ was significantly more negative for high levels of depressive symptoms ($M + 1$ SD), $\beta = -0.08$, $p < 0.001$, 95% CI [−0.10, −0.05], than for low levels ($M-1$ SD), $\beta = -0.04$, $p = 0.006$, 95% CI [−0.06, −0.01].

However, the two-way interaction did not reach significance for distraction (Table 2). Simple slope analyses indicated that the association between distraction use between t and $t-1$ and prior negative affect at $t-1$ was not significantly more positive for high levels of depressive symptoms, $\beta = 0.10$, $p < 0.001$, 95% CI [0.07, 0.14], than for low levels, $\beta = 0.08$, $p < 0.001$, 95% CI [0.05, 0.12]. Thus, we did not find support for Hypothesis 1b.

3.4 | Hypothesis 2

Finally, we tested Hypothesis 2 (the full results can be found at https://osf.io/urtnv). While the three-way interaction between prior negative affect, the monitoring and acceptance training and week, $\chi(5) = 7.79$, $p = 0.168$, this interaction involves not only the linear association of week but also the quadratic, cubic, quartic, and quintic associations of week. Importantly, the linear association was significant, $\chi(1) = 5.80$, $p = 0.016$. Simple slope analyses revealed that the association between monitoring between t and $t-1$ and prior negative affect at $t-1$ only changed significantly in the monitoring and acceptance condition, $\beta = 0.03$, $p = 0.013$, 95% CI [0.01, 0.05], but not in the control condition, $\beta = -0.01$, $p = 0.369$, 95% CI [−0.03, 0.01]. As shown in Figure 2, the association between monitoring and prior negative affect was significant in the first week of the ambulatory assessment for both the control, $\beta = -0.06$, $p = 0.015$, 95% CI [−0.11, −0.01], and the monitoring and acceptance condition, $\beta = -0.06$, $p = 0.008$, 95% CI [−0.11, −0.02], with two associations not significantly different, $b = -0.005$, $p = 0.888$, 95% CI [−0.07, 0.06]. Thus, at the beginning of the monitoring and acceptance training, participants in both the control and monitoring and acceptance conditions were less aware of their internal processes in response to negative affect. However, while the association between monitoring and prior negative affect was still significant in the last week of monitoring and acceptance training (i.e., week 6) in the control condition, $\beta = -0.09$, $p = 0.009$, 95% CI [−0.15, −0.02], it was no longer significant in the monitoring and acceptance condition, $\beta = -0.001$, $p = 0.984$, 95% CI [−0.07, 0.07]. Thus, while participants in both conditions used less monitoring in response to negative affect at the beginning of monitoring and acceptance training, only participants in the monitoring and acceptance condition increased their use of monitoring over the course of training, with the association between monitoring and prior negative affect being very close to zero and no longer significant at the end of monitoring and acceptance training.

Importantly, there was no significant effect of monitoring and acceptance training on distraction use in response to NA, both when using the categorical variable of week, $\chi(5) = 1.99$, $p = 0.851$, and when modelling a linear association of week, $\chi(1) = 0.20$, $p = 0.655$. Thus, the monitoring and acceptance training significantly impacted monitoring identification but not distraction identification, as expected.

4 | GENERAL DISCUSSION

Prior research has shown that while mindfulness, and more specifically acceptance, is associated with less negative affect than distraction, acceptance is endorsed less strongly when faced with high negative affect (Wenzel & Rowland, 2024). Here, we wanted to examine whether this negative association is problematic (Hypothesis 1) and whether it can be reduced by monitoring and acceptance training (Hypothesis 2). In Study 2, we found support for Hypothesis 1, such that reporting less monitoring after experiencing negative affect was significantly associated with more depressive symptoms. Thus, people who reported higher depressive scores tended to use less monitoring in the face of negative experiences than those who reported low scores. However, we cannot clarify the direction of this effect, that is, whether less use of monitoring contributes to the development of depressive symptoms, or whether using less monitoring results from being more depressed. Long-term studies that record daily experiences over several years may provide some clarity about what causes what.

TABLE 2 Current monitoring or current distraction as a function of prior negative affect and prior monitoring (with current monitoring as the outcome) or prior distraction (with current distraction as the outcome) and the two-way interaction between prior negative affect and depressive symptoms.

	Current monitoring			Current distraction		
Fixed effects	***β***	***p***	**95% CI**	***β***	***p***	**95% CI**
Prior negative affect	−0.06	<0.001	[−0.08, −0.04]	0.09	<0.001	[0.07, 0.12]
Prior negative affect × depressive symptoms	−0.02	0.046	[−0.04, −0.001]	0.01	0.454	[−0.02, 0.04]
Lagged outcome	0.15	<0.001	[0.12, 0.17]	0.24	<0.001	[0.21, 0.27]
Random effects	**Variance**	***p***	**95% CI**	**Variance**	***p***	**95% CI**
Prior negative affect	0.004	0.017	[0.002, 0.008]	0.012	0.001	[0.008, 0.018]
Lagged outcome	0.019	<0.001	[0.013, 0.028]	0.025	<0.001	[0.018, 0.034]

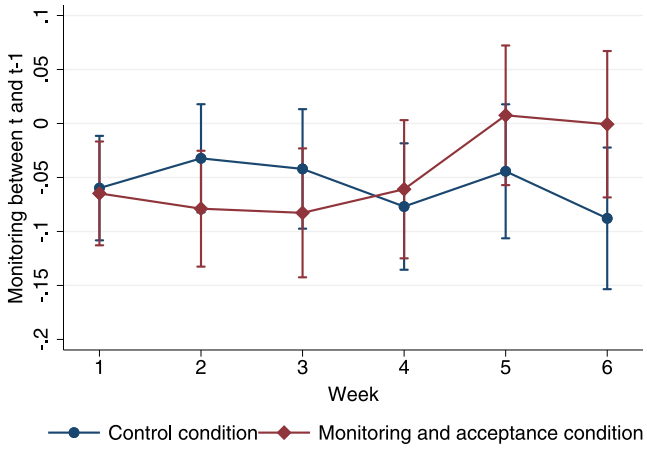

FIGURE 2 Simple slope plot to determine the effect of practicing monitoring and acceptance on the relation between prior negative affect at *t*−1 and subsequent state monitoring between *t* and *t*−1 across weeks in Study 2. The whiskers reflect the 95% confidence intervals. Mindfulness training began after week 1 (i.e., the beginning of week 2) and ended after week 6.

For Hypothesis 2, we found support in both studies, such that being less accepting (Study 1) and reporting less monitoring (Study 2) after experiencing negative affect was only the case in the control condition, but not in the monitor and acceptance condition. Thus, the monitoring and acceptance induction reduced the tendency to implement acceptance after experiencing negative affect and the monitoring and acceptance training reduced monitoring after negative affect, which in turn might reduce depressive symptoms.

However, although monitoring may be an important precursor to apply acceptance, monitoring does not necessarily lead to more acceptance: Instead, even in the absence of an accepting attitude, monitoring may increase negative symptoms by increasing affective reactivity to even negative experiences (Lindsay & Creswell, 2017). Thus, given the positive effects of higher monitoring in the present research, it may also be that the measure of monitoring additionally captures facets of an accepting attitude (Bergomi et al., 2013). Therefore, the results from the exploratory study of the EMA dataset should be interpreted with caution, and further research is needed on how mindfulness training can contribute to an accepting attitude in daily life.

These findings also connect to emotion regulation research, which found that individuals tend to avoid strong negative affect by distracting themselves or reappraise experiences only when they are less arousing (Sheppes et al., 2011). Mindfulness may help to overcome these tendencies, and instead helps to accept intense negative affect. Repeatedly accepting one's feelings then may potentially become a habit over time, which in turn can foster health (Ford et al., 2018).

However, acceptance may not always be the best way to deal with a situation. Facing a highly intense (perhaps even traumatic) situation and simply accepting it, when it could have been controlled or there were other options to deal with it, can have major consequences for one's well-being (Troy et al., 2013). In addition, in some cases, suppressing or distracting from negative experiences may even be a protective factor for one's affective well-being. For instance, individuals identified as repressive copers, that is, those who avoid unpleasant experiences, have been found to be more resilient to loss and trauma (Bonanno, 2008). Therefore, it is important to consider contextual factors to determine which emotion regulation strategy is most appropriate for whom in a given context. In addition, too much acceptance or decentering can resemble dissociation, which can also be maladaptive (Britton, 2019).

Finally, there are several limitations. First, our findings are based on data collected from samples of Caucasian undergraduate psychology students, which limits their generalisability to other populations. Second, the two monitoring and acceptance trainings differed in length and intensity. Third, the measures differed between studies, with Study 1 capturing the acceptance component of mindfulness, whereas Study 2 used the MAAS, which rather reflects the monitoring component. However, it also has been argued to capture acceptance by using only negatively worded items that implicitly reflect a judgemental stance (Bergomi et al., 2013).

Nevertheless, even though the measurement and training of mindfulness differed in the two studies, we still found similar results, suggesting that mindfulness training, regardless of the method, may help to implement a more mindful stance (i.e., monitoring and acceptance) after experiencing intense negative affect, which in turn

might reduce the relationship between emotion regulation identification and depressive symptoms. Thus, future research may turn to other emotion regulation strategies that are effective but less endorsed in difficult situations, such as reappraisal.

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CONFLICT OF INTEREST STATEMENT

None.

DATA AVAILABILITY STATEMENT

The data and statistical analyses can be found at OSF (https://osf.io/urtnv/).

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ENDNOTES

[1] The state version of the MAAS has two additional items (items 3 and 13) that were not included in the parent study to reduce participant burden due to the long study duration of 6 weeks of ambulatory assessment.

[2] Mindfulness training was not included in the models because the person means of mindfulness and distraction were 0 for all participants due to within-person standardization, and thus a between-person level variable such as mindfulness training could not explain any variance.

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