

Mindfulness, acceptance, and emotion regulation: perspectives from Monitor and Acceptance Theory (MAT)

Emily K Lindsay¹ and John David Creswell²

Experiential acceptance—an orientation of receptivity and noninterference with present-moment experiences—is described as central to mindfulness interventions, yet little experimental work has tested acceptance as a mechanism for mindfulness intervention effects. Guided by Monitor and Acceptance Theory (MAT), this review situates acceptance as an emotion regulation mechanism and reviews self-report mindfulness literature showing that attention *monitoring* skills are only associated with beneficial mental and physical health outcomes when accompanied by *acceptance* skills. New experimental dismantling work shows that removing acceptance training from mindfulness interventions reduces their efficacy for improving stress, positive emotion, and social relationship outcomes. Overall, converging evidence demonstrates that acceptance is a critical emotion regulation mechanism of mindfulness interventions. This work advances basic research, has translational value, and offers opportunities for future research.

Addresses

¹ University of Pittsburgh, United States

² Carnegie Mellon University, United States

Corresponding author: Lindsay, Emily K (ekl24@pitt.edu)

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Experiential acceptance and equanimity skills are commonly described as central to many contemplative practices and third-wave therapeutic interventions [1], yet relatively little experimental work has explored the mechanistic role of acceptance skills training in mindfulness interventions. Contemporary mindfulness interventions instruct two specific mindfulness skills: (a) how to use attention to *monitor* present-moment experiences and (b) how to orient toward these experiences with *acceptance*, openness, and equanimity [2]. We use ‘acceptance’ as an umbrella term to describe an orientation of receptivity and noninterference with present-

moment experiences [3,4^{••}], which contrasts with tendencies to suppress, avoid, alter, prolong, or fixate on certain stimuli. Rather than striving for pleasant experiences (craving) and avoiding negative experiences (aversion), acceptance and equanimity break the typical association between desire (i.e. wanting and not wanting) and the hedonic tone (i.e. pleasant and unpleasant) of experiences [5[•]]. In practice, all momentary experiences are allowed to arise, unfold, and pass regardless of their valence. We recently developed a new theoretical model, Monitor and Acceptance Theory (MAT), which conceptually explains how monitoring and acceptance skills interact to drive mindfulness and mindfulness intervention effects [6^{••}]. Specifically, MAT posits that (a) skills in *monitoring* the present moment may enhance the vividness of experience, thus intensifying affective reactivity, but that (b) bringing an attitude of *acceptance* toward monitored experiences is a key emotion regulation mechanism for the effects of mindfulness interventions on affective, stress, social relationship, and health outcomes.

This selective review first situates acceptance as an emotion regulation mechanism and reviews emerging literature testing MAT’s acceptance predictions in the context of trait mindfulness. We then focus on new work that dismantles acceptance from mindfulness interventions to experimentally test these predictions. We conclude by describing how new research has advanced MAT and suggest directions for future research.

MAT: acceptance as an emotion regulation mechanism

Prominent theoretical models identify emotion regulation as a central mechanism for the effects of mindfulness on mental and physical health outcomes, acting to reduce affective and physiological reactivity and promote recovery [7]. And indeed, meta-analytic evidence shows that emotion regulation processes mediate the effects of mindfulness interventions on improvements in mental health [8]. In contrast, ineffective emotion regulation is a core feature of psychopathology [9], and a growing body of evidence relates non-acceptance—including experiential avoidance [10,11], emotional non-acceptance [12], and distress intolerance [13]—with clinical symptoms. Moreover, the emotion regulation literature shows that acceptance is an effective strategy [14], and acceptance training is considered a key therapeutic element of many clinical interventions targeting anxiety, depressive, and other disorders characterized by experiential avoidance

(e.g. Refs. [15,16]). Building on this rich tradition, MAT posits that acceptance skills are a critical feature of mindfulness interventions that drive emotion regulation and subsequent improvements in mental and physical health outcomes.

Importantly, present-focused awareness ('monitoring') is a core feature of mindfulness (which is canonically described as a state of clear awareness [17]), and as such, MAT focuses on the synergistic effects of monitoring and acceptance. Acceptance is thought to transform how momentary experiences are observed and processed, facilitating engagement (i.e., welcoming in) and subsequent disengagement (i.e., letting go) with emotional stimuli [18–20], and thus enriching experience while also reducing emotional reactivity. Studies of trait mindfulness components in non-meditating samples generally support MAT's predictions that monitoring alone can increase affective reactivity, whereas monitoring and acceptance skills together promote emotion regulation and favorable affective, stress, and health outcomes [21]. Specifically, recent work shows that, when unaccompanied by self-reported acceptance skills, the self-reported tendency to monitor one's present moment experiences has been linked with outcomes reflecting emotion dysregulation, including affective symptoms (e.g., higher depressive, anxiety, and other clinical symptoms [22–25]), poor social relationship functioning [26,27], and poor health behaviors and outcomes (e.g. Refs. [28,29]). In contrast, in these same studies, people who report high levels of both monitoring and acceptance skills show evidence of successful emotion regulation, including lower negative affectivity, adaptive social relationship functioning, and salutary health behaviors and outcomes.

On the other hand, trait monitoring skills, independent of acceptance skills, have also been associated with enhanced positive affectivity (e.g., life satisfaction and purpose [25,30]). Moreover, EMA studies have shown that monitoring present-moment experience—assessed in the moment—is related to greater concurrent positive affect [31,32]. As such, the trait mindfulness literature suggests that monitoring skills alone may be sufficient to heighten positive experiences [33].

Overall, correlational evidence supports MAT's predictions that monitoring skills may intensify both negative and positive affect, but when paired with acceptance skills, monitoring and acceptance together facilitate emotion regulation and foster mental and physical health. However, these studies do not test the development of monitoring and acceptance skills through mindfulness training. One important question is whether the correlations observed in self-report mindfulness studies generalize to the mechanisms underlying mindfulness interventions.

Testing MAT: dismantling acceptance from mindfulness interventions

To test whether learning acceptance skills is a critical emotion regulation mechanism of mindfulness interventions for improving affective, stress, and social relationship outcomes, recent studies have employed intervention dismantling designs. Dismantling designs have been recommended and used to identify active treatment elements of multi-component mindfulness interventions [34,35]. We have adopted this experimental approach to test whether removing acceptance skills training from mindfulness interventions reduces or eliminates treatment-related improvements in emotion regulation-relevant outcomes.

Early iterations of this dismantling approach provide initial support for the importance of acceptance instruction in mindfulness interventions for regulating emotion. For example, in the context of recalling and writing about a traumatic experience, instruction to adopt an accepting, nonjudgmental stance buffered against the negative affect associated with monitoring the contents of present-moment awareness [36]. Similarly, three sessions of mindfulness meditation with both monitoring and acceptance instruction reduced mind-wandering on a frustrating sustained attention task relative to mindfulness training without acceptance instruction [37]; acceptance practice may have facilitated disengagement with emotionally-charged thoughts, given that the self-reported 'stickiness' of thoughts can impair performance on this task [38].

More recently, we conducted two dismantling RCTs to compare the effects of (a) standard mindfulness training in both monitoring and acceptance (Monitor + Accept) versus (b) structurally matched mindfulness training only in monitoring present-moment experiences (Monitor Only). These parallel trials recruited stressed community adults and tested for post-intervention differences in acute stress reactivity and changes in daily life stress, affect, and social relationship outcomes. In both trials, all active interventions were framed as stress management programs and produced equivalent treatment expectancies, ruling out placebo effects. The trials differed in intervention length (two-week versus eight-week), delivery format (individually delivered smartphone-based versus group-based Mindfulness-Based Stress Reduction (MBSR)), and control group (active control intervention versus no treatment). Together, the trials allowed us to isolate the unique contributions of acceptance training from other treatment components.

Building on the idea that acceptance skills foster emotion regulation, a primary MAT prediction is that acceptance training is a necessary component of mindfulness interventions for reducing stress. First, in our 14-lesson smartphone-based intervention trial, Monitor + Accept

mindfulness training decreased cortisol and blood pressure reactivity to acute stress compared to Monitor Only and active control trainings [39**]. However, our eight-week dismantling trial found no condition differences in biological stress reactivity (unpublished data). Mindfulness intervention effects on biological stress reactivity outcomes are not all consistent (e.g. Ref. [40]), and it is possible that a pre-stress booster meditation session (implemented in our two-week trial) or more sustained mindfulness practice may be necessary to reliably impact biological reactivity on powerful acute stress tasks. Second, in the context of daily life subjective stress, our two trials suggest dosage effects; medium-sized decreases in daily life stress were observed following two-week Monitor + Accept training ($d = 0.45$) and large decreases following eight-week Monitor + Accept training ($d = 0.72$). Significant advantages of Monitor + Accept over Monitor Only training emerged after eight-week training ($d = 0.38$) [41], with a smaller nonsignificant advantage after two-week training ($d = 0.16$) (unpublished data). Together, these findings demonstrate a clear role of acceptance training in mindfulness interventions for stress reduction effects, and suggest that improvements in daily life stress build with continued practice.

In addition to regulating stress responding, acceptance appears to be a critical component of mindfulness interventions for boosting positive psychosocial outcomes. In both of our recent trials, Monitor + Accept training was more effective for increasing positive emotions in daily life compared to Monitor Only training and control groups across different training lengths and delivery methods [42*]. Orienting toward momentary experiences with receptivity, openness, and acceptance may broaden awareness and afford people greater access to positive stimuli that might otherwise go unnoticed in daily life. Our two-week trial also showed that acceptance is an active component of mindfulness for reducing loneliness and increasing social contact in daily life [43]. These findings suggest that acceptance skills drive emotion regulation in ways that improve social relationships [44,45]; bringing equanimity to feelings of loneliness and social threat may allow them to dissipate, and bringing openness and curiosity to social situations may encourage greater engagement with others in daily life. A growing body of evidence shows benefits of mindfulness interventions for boosting positive emotions and improving social relationships. In addition to promoting health via stress and symptom reduction [46], mindfulness interventions may also boost positive resilience factors with potential implications for improving long-term health outcomes (e.g. Refs. [47–49]).

All together, these dismantling trials offer promising evidence that acceptance is a critical emotion regulation mechanism for mindfulness intervention effects. By experimentally dismantling mindfulness interventions

and conceptually replicating findings across different lengths of training and delivery formats, these studies underscore the importance of acceptance training for regulating emotional reactivity, stress, and loneliness and for opening awareness in ways that boost positive affect and social engagement.

MAT insights, revisions, and future directions

We reviewed evidence that trait acceptance skills moderate the link between present-focused attention monitoring and poor emotional, social, and health functioning, and that removing acceptance training from mindfulness interventions reduces their efficacy for improving stress, positive emotion, and social relationship outcomes. Together, recent evidence suggests that acceptance is a critical emotion regulation mechanism of mindfulness interventions.

Yet further work is needed to directly test mechanistic pathways linking mindfulness training, acceptance skill development, and changes in emotion regulation processes. As an emotion regulation skill, acceptance may influence the deployment of attention toward emotional stimuli and facilitate more flexible use of multiple regulatory strategies [50]. First, acceptance strategies have been shown to enhance attention to novel emotional stimuli [51] while also dampening physiological reactivity [52–54], reflecting a nonreactive attentional engagement with emotional experiences. Second, although acceptance does not involve intentionally changing emotional experience [55*], early emotion processing and regulation may facilitate the use of reappraisal, distraction, and other strategies in appropriate contexts [56,57]. Clarifying how acceptance acts to regulate emotion is an important direction for future mindfulness intervention research. Study designs that dismantle acceptance from mindfulness interventions and those that test acceptance as a mediating mechanism of mindfulness interventions can both contribute to this question, with ambulatory assessment approaches providing a promising way to test for intervention-related changes in acceptance and emotion regulation in daily life [58].

There are also many opportunities to test MAT predictions in other domains; mindfulness interventions show a broad range of effects across cognitive, affective, and health domains. For example, although Monitor + Accept interventions improved health-relevant outcomes (e.g., stress; stress biology [46]), further work is needed to test acceptance as a mechanism for improving long-term markers of health in at-risk populations. The cognitive domain is also underexplored, and MAT predicts that monitoring alone is sufficient for boosting affectively-neutral cognitive outcomes [6**].

The intervention dismantling work we have conducted so far in stress and affective domains provides insights

that suggest potential revisions to MAT. MAT's predictions were developed from patterns observed in correlational self-report mindfulness studies, which consistently relate monitoring skills with heightened affective reactivity in predominantly meditation-naïve samples. Although Monitor Only mindfulness interventions were not effective for reducing stress, neither did they intensify negative or positive affectivity. Our experimental findings suggest that systematic monitoring practice may improve attentional control in ways that promote emotional clarity, which could promote emotion regulation over time [59]. However, at least in the early stages of meditation practice, developing greater awareness by itself does not provide an efficient means for reducing stress. Also in contrast with the self-report mindfulness literature, Monitor Only interventions were not sufficient for enhancing positive emotions; acceptance may be necessary to open awareness to the many positive stimuli that are available to be monitored and appreciated. Overall, this new experimental work highlights some unique effects of developing mindfulness skills through formal practice compared to naturally occurring trait mindfulness tendencies, and leaves room for further research to establish the time course of monitoring and acceptance skill development and maintenance of training effects.

Broadly, recent findings from dismantling trials have translational value for improving the quality and efficiency of mindfulness interventions. Mindfulness-specific improvements in stress, emotion, and social relationship domains may be maximized by emphasizing concrete acceptance and equanimity training techniques. To further amplify intervention efficiency, intervention dismantling approaches hold promise for identifying target populations who may benefit more from certain skills (e.g., people low in trait acceptance may benefit more from mindfulness interventions that emphasize acceptance training [60]) and developing tailored interventions for these population subsets. Finally, this dismantling work provides an opportunity to find common ground between behavioral interventions, with the possibility that acceptance is a common emotion regulation mechanism underlying treatment effects across a variety of interventions (e.g., Acceptance and Commitment Therapy, expressive writing [1]).

Conclusions

Accumulating evidence shows that experiential acceptance is a critical component of mindfulness interventions for improving affective, stress, and social relationship outcomes. This work advances basic research on the mechanisms of mindfulness, has translational value for maximizing the efficiency and impact of mindfulness interventions, and offers exciting opportunities for future research.

Conflict of interest statement

Nothing declared.

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