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ORIGINAL PAPER

"Boiled Water Softens the Potato But Hardens the Egg": Perceived Utility of Mindfulness and Reappraisal Strategies and Relations to Compliance In Situ

Almaz Mesghina[1,2] · **Lindsey Engle Richland**[3]

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Abstract

Objectives Individuals in laboratory settings frequently do not comply with instructed emotion regulation (ER) strategies as stressor intensity increases—sometimes not using ER at all, often switching from reappraisal to strategies like mindfulness. Though some have explored predictors of ER choice, few have done so in situ as individuals regulate responses to self-relevant, ongoing stressors, nor directly asked how individuals perceive the utility of ER strategies after instruction.

Methods In total, 290 American undergraduates from two large, minority-serving institutions were assigned to regulate their COVID-19 pandemic-related distress using mindfulness or reappraisal. Previously, research found that participants' compliance was imperfect, especially for reappraisal. In the present study, we qualitatively analyzed participants' responses to an item asking *why* they believed their strategy was/was not useful and analyzed whether these themes predicted compliance.

Results Most participants expressed ambivalence about their strategy. Mindfulness noncompliers were more likely to mention context and individual differences themes as important for the utility of their strategy. Controlling for mindfulness condition and pandemic-related distress, which both positively predicted compliance, mentioning individual differences predicted a 69% decrease in the likelihood of compliance (OR 0.31, 95% CI [0.13, 0.75], $p = 0.009$).

Conclusions Though mindfulness had higher compliance when compared to reappraisal, their compliance narratives tended to focus on utility limits: elucidating under which contexts and for whom mindfulness would be further useful. We underscore the importance of research on ER choice in situ, including continued investigation of reasoners' perceptions of and compliance to their real-life emotion regulatory opportunities.

Preregistration The analyses reported here were not preregistered. However, they use previously unanalyzed and unreported data from Mesghina et al. (2021; Study 2), which was pre-registered (osf.io/kq9gp).

Keywords Emotion regulation choice · COVID-19 · Acceptance · Stressor intensity · Mixed methods

Much research in emotion regulation (ER) has focused on reappraisal—a form of cognitive ER where one changes their appraisal of a situation or a stressor before activating an emotional response—as an optimal strategy for well-being generally (Gross, 1998), with calls for reappraisal interventions to help downregulate feelings of distress in individuals' everyday lives (see Crum et al., 2020). However, compared to other ER strategies, individuals rarely use reappraisal in daily life (Brans et al., 2013; Haines et al., 2016; Wenzel et al., 2023), even failing to comply when explicitly instructed to do so (Mesghina et al., 2021; Opitz et al., 2015). Instead, participants often switch to other ER strategies (Sheppes & Meiran, 2008) if they even choose to use ER (Sheppes, 2020). One such strategy often preferred to reappraisal is mindfulness, which is defined as a process of intentional monitoring and awareness of one's present experience and nonjudgmental acceptance and release of one's current thoughts and feelings (Bishop et al., 2004; Creswell, 2017; Lindsay & Creswell, 2019), and for which there has

✉ Almaz Mesghina
mesghina@northwestern.edu

[1] Department of Psychology, Northwestern University, 2029 Sheridan Road, Evanston, IL 60208, USA

[2] Institute for Adolescent Mental Health and Wellbeing, Northwestern University, 2029 Sheridan Road, Evanston, IL 60208, USA

[3] School of Education, University of California, 3200 Education, Irvine, CA 92636, USA

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also been increased attention and calls for real-world interventions (Behan, 2020; Kwon, 2023; see Creswell, 2017).

Research has proposed key cognitive and motivational determinants of ER strategy selection and their mechanisms (Milyavsky et al., 2019; Sheppes et al., 2014), mainly focusing on when individuals choose to cognitively reappraise their emotions (an antecedent-focused strategy) versus suppressing or distracting themselves from their emotions (response-focused strategies). In sum, cognitive reappraisal has many constraints that limit its attractiveness and/or suitability in contexts that evoke negative emotions, and particularly for higher intensity emotions (see Sheppes et al., 2014). Specifically, reappraisal may be uncomfortable in that it requires increased initial emotional engagement with a stressor, which is not preferred when individuals possess more immediate, hedonistic goals (Sheppes et al., 2014). Moreover, reappraisal may not be suited for all situations, as not all stressors afford an opportunity to reappraise one's emotions or the situation (Suri et al., 2018; see also Ford & Troy, 2019). Lastly, adopting an appraisal of a highly stressful experience as either neutral or positive is uncommon (Suri et al., 2015), likely because individuals' default appraisals of intense or stressful stimuli are typically negative (Liu et al., 2017). This supports other work underscoring the cognitively demanding nature of generating reappraisals for intense stimuli (Aldao, 2013; Milyavsky et al., 2019; Sheppes & Meiran, 2008; Suri et al., 2015; Troy et al., 2018). Thus, for participants experiencing intense, negative emotions, reappraisal may be less suitable and more effortful.

Still, two important measurement considerations suggest incomplete understanding of ER strategy selection. First, many studies have used forced-choice designs—for instance, having participants click a button to indicate whether they want to use an instructed reappraisal or distraction strategy to regulate their emotions (e.g., Sheppes et al., 2011). In fact, the bulk of the ER choice research has focused on just two forced-choice comparisons: reappraisal versus suppression or reappraisal versus distraction (for discussions, see Aldao, 2013; Sheppes & Levin, 2013). Such comparisons can elucidate the conditions under which one strategy is preferred to another in the experimental setting, but not whether one is preferred generally (Aldao, 2013).

Relatedly, there is growing consensus that ER should be considered a multi-step, iterative decision process (Bonanno & Burton, 2013; Ford et al., 2019; Sheppes, 2020). Individuals regulating their emotions make a series of choices during the regulatory process: First, selecting whether they desire to regulate their emotions, then selecting among available ER strategies in their repertoire, followed by implementing said strategies, and monitoring their regulatory success (Sheppes, 2020). Most of the literature on ER choice examines selection, with comparably much less known about individuals' subsequent decisions after a strategy is chosen (Sheppes, 2020)—namely, whether they in fact comply with the selected strategy after attempting.

Some evidence for non-compliance comes from laboratory studies that have examined ER switching: when do participants report *not* using their instructed strategy*?* Study designs that explicitly ask participants what ER strategies they employed after receiving instruction and attempting the strategies are well suited to understand when and why individuals do not comply (Aldao, 2013). When asked, adults who were trained and instructed to use one ER strategy often report using many uninstructed ER strategies. For instance, Demaree et al. (2006), who assigned individuals to behaviorally regulate their reactions to emotionally evocative images, found that half of the sample reported using non-instructed strategies (see Parsafar & Davis, 2019; Parsafar et al., 2019 for similar evidence with children). This non-compliance may be adaptive, as monitoring one's regulatory success and switching between ER strategies predicts healthier affective and physiological outcomes (see Bonanno & Burton, 2013), particularly when attempting reappraisal (Birk & Bonanno, 2016).

Furthermore, individuals regulating their emotions often do not use one strategy at a time (i.e., emotion polyregulation; Ford et al., 2019). Across four studies, Opitz et al. (2015) instructed participants to cognitively reappraise their emotional reactions while watching distressing videos. Compliance to reappraisal among the sample was good, though not perfect (80–84%). Moreover, a significant proportion of participants (18–35%) also reported using multiple, non-reappraisal ER strategies in addition to their instructed reappraisal strategies (Opitz et al., 2015). Contrary to the objectives of reappraisal, these non-instructed ER strategies mainly included attentional and emotional decentering strategies, which have been shown to be more frequently utilized as stressor intensity increases (see Sheppes et al., 2011, 2014) or when individuals engage in stressful tasks without ER instruction (Burr et al., 2021).

Taken together, these studies present considerable evidence of non-compliance to instructed ER strategies in the laboratory. They also suggest these compliance decisions change in response to features of the stressor and the context (see also Aldao, 2013; Sheppes, 2020; Sheppes & Levin, 2013). Still, nearly all the empirical evidence for ER choice comes from experiments conducted in the laboratory. Yet, behavioral and self-reported measures of ER in the laboratory are often only weakly related to ER as measured in daily life (Koval et al., 2023), if at all (Burr et al., 2021). In fact, Burr et al. (2021) found that self-report measures of everyday suppression and reappraisal use had no relation to whether individuals used these strategies to regulate their emotions, suggesting that individuals' ER selection and compliance decisions in the laboratory may not represent

their real-life use. Put differently, laboratory studies of ER use and compliance may be limited in their ecological validity.

Like reappraisal, mindfulness is a highly investigated and endorsed ER strategy for helping individuals manage high levels of emotional distress (Behan, 2020; for reviews, see Creswell, 2017; Kwon, 2023). Unlike reappraisal, which asks individuals to change the thoughts and feelings they have during an emotional experience, mindfulness invites individuals to accept the feelings and appraisals as they are, without changing them (Wenzel et al., 2023). More specifically, mindfulness is characterized by continual awareness to the present moment, nonjudgmental observance and acceptance of emotional experience, and decentering from one's distressing thoughts (Bishop et al., 2004; Creswell, 2017). Mindfulness and strategies related to core components of mindfulness (namely, acceptance) have been shown to be more effective for downregulating negative affect than reappraisal strategies (Keng et al., 2013; Kozubal et al., 2023; Lalot et al., 2014; Pogrebtsova et al., 2018). Moreover, mirroring the laboratory evidence, mindfulness is more likely to be used in everyday life than reappraisal, of which adults have reported quite low spontaneous use (Brans et al., 2013; Haines et al., 2016; Wenzel et al., 2023). This is likely because mindfulness strategies impose less of a burden on cognitive resources compared to reappraisal, while remaining equally (if not, more) effective for downregulating negative affect (Keng et al., 2013, 2017; Troy et al., 2018; Wenzel et al., 2023). Acceptance of emotional experiences, theorized to be a key component of mindfulness's efficacy (see Lindsay & Creswell, 2019), was also the factor that predicted improvements in participants' daily negative affect (Blanke et al., 2018; Wenzel et al., 2023). Surveys of spontaneous ER use during the COVID-19 pandemic have also found that mindfulness-related strategies were far more frequently used by adults and undergraduates than reappraisal-based strategies (redefining, reframing; Lischetzke et al., 2022; Son et al., 2020). Indeed, the most common pandemic coping profiles contained a mix of mindfulness-related strategies (Lischetzke et al., 2022).

A key question, then, is why participants use and prefer mindfulness to reappraisal. This is important given previously stated concerns that selecting an ER strategy does not necessarily imply compliant subsequent use of the strategy (Sheppes, 2020). Indeed, attrition rates in mindfulness-based interventions (see Cavanagh et al., 2014) and mindfulness meditation app use (e.g., Goldberg et al., 2020; Sullivan et al., 2023) have ranged from a quarter to half of all participants. Banerjee et al. (2018) argued that compliance to mindfulness is not only simply completing the requisite sessions (physical engagement), but also psychologically engaging in the practice. Psychological engagement captures individuals' motivation, intention, and commitment to earnest practice, and their belief in the efficacy of the practice, all of which predicted mindfulness outcomes regardless of individuals' physical engagement (Banerjee et al., 2018). Importantly, individuals who reported higher frequency of rumination and worrying in their day-to-day also reported lower psychological engagement and subsequently lower mindfulness outcomes, suggesting these individual differences are important for compliance to mindfulness (Banerjee et al., 2018; see also Crane & Williams, 2010).

Qualitative investigations of undergraduates' perceptions of mindfulness-based training in their everyday settings have elucidated its adaptive and/or preferred qualities in participants' own words, with implications for compliance. A meta-review of 18 qualitative studies revealed that undergraduates practicing mindfulness have described improved focus, greater awareness to the present moment and to their own affective state, and generally improved ER capabilities as key positive outcomes of their mindfulness practice (see Bamber & Schneider, 2022). These positive themes have continued to emerge in individuals' accounts of using mindfulness to manage emotions towards stressors in the real world (Xie et al., 2024), like dealing with COVID-19-related distress (Nardi et al., 2022).

Furthermore, themes capturing individuals' actual and perceived barriers to mindfulness have reliably emerged from qualitative analyses, self-report, and experimental designs. When asked, individuals in mindfulness-based training programs have described little motivation to engage in the practice as a key barrier to their compliance to the program (Xie et al., 2024; Xu et al., 2021; see Bamber & Schneider, 2022). Citing many other constraints on their time, individuals reported greater perceived efficacy of mindfulness (Nardi et al., 2022; Xie et al., 2024) or evidenced more compliant use (Sullivan et al., 2023), when mindfulness practice was able to be incorporated into their day-to-day activities.

Relatedly, the context in which one practices mindfulness also emerged as a key barrier in qualitative investigations. Individuals often disclosed that they could not complete mindfulness practice without access to a private or quiet space (Xu et al., 2021), or that mindfulness-based interventions would be more efficacious if they had increased social support in the program to help make them more accountable to their daily practice (Nardi et al., 2022; Xie et al., 2024). This mirrors quantitative evidence showing undergraduates may experience worsened anxiety if mindfulness-based trainings have a home practice component (see Bamber & Morpeth, 2019), where it is harder to do mindfulness "right," which may increase frustration and abandonment. Likewise, Lymeus et al. (2022) also found that undergraduates completing a mindfulness program in a garden showed greater compliance to their practice than those completing the program in a classroom. The perceived restorativeness of the

practice setting was a key explanatory mechanism (Lymeus et al., 2022), underscoring the role of the context, including how conducive it is to mindful reflection, as important for compliance to mindfulness.

In a previous study (Mesghina et al., 2021), we randomly assigned undergraduates to receive brief instruction in mindfulness or reappraisal ER strategies to regulate their COVID-19 pandemic-related distress immediately prior to an educational lesson. Undergraduates were the focal participants given they had the highest reported rates of distress during the pandemic among all adults (Pasquini & Keeter, 2022; Wang et al., 2020). An educational context was the focal setting for ER given concerns about pandemic-related academic impacts for these individuals due to the disruptions and intense emotions (Bailey et al., 2021; Kaffenberger, 2021) and given that mindfulness and reappraisal interventions have both been shown to mitigate the deleterious effects of distress on undergraduates' attention and academic performance (e.g., Brunyé et al., 2013; Crum et al., 2020). Results revealed evidence for a mediation pathway by which pandemic-related distress predicted greater mind wandering during the lesson, which in turn predicted lower learning from the lesson (Mesghina et al., 2021; Studies 1, 2). Receiving brief mindfulness-based instruction predicted lower levels of mind wandering than receiving reappraisal instruction (Study 2). However, participants' reported compliance to the instructed strategies was imperfect, and significantly lower for reappraisal than mindfulness. This is in accordance with the literature on ER switching (e.g., Sheppes et al., 2011, 2014) but raises theoretical questions about how and for whom such interventions are effective. Moreover, individuals with higher pandemic-related distress were *more* likely to comply, regardless of strategy (Mesghina et al., 2021), countering prior arguments that the likelihood of switching, particularly switching from reappraisal, increases with stressor intensity.

Therefore, the present, mixed-methods study explored these undergraduate participants' reasons for noncompliance with their instructions to regulate their emotions regarding the COVID-19 pandemic, 7 to 12 months after its onset. The pandemic context provided an opportunity to examine ER choice when regulating self-relevant, dynamic, and ongoing emotions in individuals' everyday settings (i.e., in situ), for which there has been a dearth of research (Aldao, 2013; though see Burr & Samanez-Larkin, 2020). Moreover, little—if any—work has simultaneously compared participants' perceptions of both mindfulness and reappraisal strategies, nor empirically investigated whether these perceptions predicted participants' immediate compliance to said ER strategy. Understanding individuals' perceived utility of their ER strategies can more clearly elucidate how individuals conceptualize these strategies, which may predict compliance even after accounting for their levels of distress. Therefore, the current study used an exploratory, inductive thematic analysis coding process to capture participants' perceptions of the utility of their randomly assigned ER strategy (utility-evaluative themes; research question 1). This study compared whether the proportion of individuals mentioning the themes differed between compliers and noncompliers, and between those assigned to use mindfulness and reappraisal (research question 2). This study also tested whether these utility-evaluative themes predicted compliance, regardless of individuals' feelings about the pandemic stressor and their general anxiety (research question 3).

Method

Participants

We analyzed qualitative statements made by the 290 individuals who participated in an experiment and were randomly assigned to receive brief instruction on mindfulness ($n = 147$) or reappraisal ($n = 143$; Mesghina et al., 2021; Study 2). These qualitative statements were not analyzed nor included in the 2021 paper and address different research questions. Participants were undergraduates (79% women) recruited from October 2020 to March 2021 during the COVID-19 pandemic. Participants' self-reported racial/ethnic identifications (49% Asian-American/Pacific Islander, 36% Hispanic/Latinx) corresponded with the demographics of the universities from which they were recruited (see Online Resource 1 for more details on sample demographics). The original 2021 study was pre-registered; the current study was not, as these analyses were exploratory and emerged from the original data. Still, apart from participants' identifiable narratives, all data are made available here (osf.io/zn89b).

Procedure

See Mesghina et al. (2021; Study 2) for full details on the original study design. Only the procedures and measures from that data collection relevant to the new data analyzed here are reported in this manuscript. All study materials were provided through Qualtrics, and participants were asked to find a quiet place to complete the study. Participants first provided informed consent, then reported their pandemic-related distress and trait anxiety. Afterwards, participants were randomly assigned to receive brief instruction on either mindfulness or reappraisal as a strategy to help mitigate the effects of pandemic-related distress. They practiced the assigned ER strategies, then were instructed to use them while they watched a 14-min educational lesson. After the lesson, participants were asked questions about compliance and perceived utility of their strategies. The responses to these two questions are the focus of the present study.

Emotion Regulation Interventions

Participants' instruction in mindfulness and reappraisal took the form of 3-min videos, followed by an additional 3 min of structured practice. The instructional videos aimed to (1) normalize the experience of distress and distraction as experienced by previous undergraduate participants during the COVID-19 pandemic recruited in Mesghina et al., (2021; Study 1); (2) describe how distress can affect attention and performance; and (3) introduce either the mindfulness or reappraisal strategy and, importantly, how the strategy could help them reduce distractions in the face of distress. Though these ER videos were designed by the experimenters, they were highly modeled after prior successful reappraisal (Beltzer et al., 2014; Crum et al., 2013; Jamieson et al., 2010) and mindfulness-based (Erisman & Roemer, 2010; Mrazek et al., 2012, 2013; Schuster et al., 2015) interventions that were of similar lengths. The video scripts are provided in the Online Resource 2.

In the mindfulness video, participants were instructed on how to practice the key components of mindfulness: continual awareness to the present moment, nonjudgmental observance and acceptance of emotional experience, and decentering from one's distressing thoughts. The mindfulness video analogized thoughts in one's mind to clouds passing in the sky to illustrate the strategy and help individuals practice remaining present minded. Much like distant clouds passing in the sky that one cannot touch, participants were invited to nonjudgmentally acknowledge the contents of any thoughts that may arise, recognize they cannot control them in the present moment, and accept them as they come and go. They were instructed that doing so could help them gently return to the present moment more so than forcing away any negative thoughts that arise.

In the reappraisal video, participants were informed that though stress is often considered something to be avoided, it can also be neutral or adaptive. This was visualized using the Yerkes-Dodson inverted-U illustration of arousal and performance and was analogized to the *Goldilocks* story—here, too little stress and too much stress are not optimal, but moderate stress is "just right" for one's engagement and performance. The video emphasized that this optimal experience can be achieved by changing one's appraisal of their feelings of stress—from something that must be avoided to something that can be embraced. To this end, participants were taught some of the positive functions of stress—specifically that stress (in moderation) signals that one's body is recruiting physiological, motivational, and cognitive resources necessary to achieve task-related goals. At the end of both videos, participants were instructed that successfully utilizing their strategy has been shown to not only help reduce feelings of distress, but also help them preserve (mindfulness) or recruit (reappraisal) the limited cognitive resources necessary for attention, performance, and learning. Research citations were provided alongside these videos.

After watching the instructional videos, participants were given 3 min to practice their strategy. They were asked to reflect on their strategy and then free write about how it could help them manage any feelings of distress they may experience as they attended to the upcoming lesson. The Qualtrics survey was programmed so that participants could not advance through the ER instructional videos, nor through the practice page, before the requisite time had passed.

Measures

Affective Experiences: Pandemic-Related Distress and Trait Anxiety

Participants reported their pandemic-related distress using a version of the 15-item Impact of Event Scale (Horowitz et al., 1979; Cronbach's $\alpha = 0.85$, McDonald's $\omega = 0.85$) modified to capture reactions to the pandemic (e.g., "I think about the COVID-19 pandemic when I do not mean to"; Wang et al., 2020). Then, they reported their trait anxiety using the 20 items in the trait subscale of the State-Trait Anxiety Inventory (Spielberger et al., 1983; $\alpha = 0.93$, $\omega = 0.93$; e.g., "I feel like a failure"). We measured trait anxiety to isolate the effects of pandemic-specific affective experiences.

Compliance

Participants in both conditions reported their compliance. This was done by answering the question*:* Did you use the strategy during the lesson? Participants selected yes (1) or no (0).

Utility Narratives

Immediately after the compliance question, participants were asked the following open-ended question*:* "Please share why you think this strategy is useful/not useful." Participants' narrative responses to this question constitute the key data analyzed in the present manuscript. Three research assistants, who were untrained in the ER literature and blind to both the conditions and the research questions, coded the open-ended responses to the utility narratives using a thematic analysis approach (Braun & Clarke, 2022) to develop data-driven, theme-based codes to capture quantitative frequency data on patterns in participants' explanations. The intention was to inductively develop empirical codes, rather than deductively apply theory-driven codes that may not have reflected the emergent or unexpected beliefs by participants. Similar inductive and exploratory thematic analyses have been done when investigating individuals' perceived

barriers to mindfulness (e.g., Xie et al., 2024). The non-mutually exclusive themes were coded at the narrative level.

Holistic Efficacy Evaluations of Narratives

Coders first read through all the narratives to familiarize themselves prior to coding. Then, for each narrative, coders independently provided a holistic evaluation as to the individual's overall perceived efficacy of their strategy. These could be coded as wholly effective, wholly ineffective, or mixed. The latter code was given if the individual described their strategy as conditionally effective or expressed ambivalence when describing their strategy. Half of all narratives were coded as mixed, which motivated us to more closely explore themes in participants' narratives.

Thematic Coding

Coders followed the thematic analysis approach to identify emergent themes within the narratives. Specifically, coders first independently examined recurrent patterns in a subset of the narratives to formulate preliminary themes, then met to discuss and agree upon common themes. Afterwards, they conducted two practice rounds to assess whether these common themes applied to new participant narratives, refining the themes and descriptions and ultimately agreeing upon the final superordinate and subordinate themes and their operational definitions (see Table 1). The coders achieved satisfactory interrater reliability on a randomly selected 20% of the narratives (Krippendorff's αs: 0.62–0.94; Hayes & Krippendorff, 2007). Any subsequent coding disagreements were resolved via discussion among the three. Clear relations among the final themes were observed by the first author, who was trained in the ER literature and developed the study materials: Some themes were highly related to the mindfulness and reappraisal instructional videos' content (*strategy-descriptive themes*) whereas the other themes captured individuals' evaluations of the utility of the strategies (*utility-evaluative themes*). Our outcome of interest was the proportion of participants mentioning each theme.

Data Analyses

All analyses were conducted using Stata. We first report balance checks confirming equivalence across ER conditions and compliance groups in affective states and narrative length. Then, we describe each of the emergent thematic codes, provide example quotes, and report the proportion of individuals mentioning each theme (research question 1). We report chi-squared tests comparing frequencies of thematic mentions by condition and compliance (research question 2), then use logistic regression to explore whether compliance was predicted by each of the superordinate themes (research question 3). We excluded subordinate codes to avoid overfitting; results held either way. For the regressions, we report marginal probabilities and control for participants' trait anxiety to focus on effects of pandemic-specific distress and ER.

Results

Balance Checks

Trait anxiety ($M = 51.67$, $SD = 11.67$, range 25–79) for this sample was moderate with regards to the possible range of scores (20–80). Trait anxiety did not differ between conditions ($t(288) = 0.40$, $p = 0.69$; 95% CI [−2.16, 3.24]; $d = 0.05$), nor by strategy compliance ($t(288) = 0.48$, $p = 0.63$; 95% CI [−2.35, 3.85]; $d = 0.06$). Pandemic-related distress was quite high in this sample ($M = 25.98$, $SD = 13.38$, range 0–61, possible range 0–75). Forty-eight percent of participants met the criteria for severe (> 44) or moderate (> 26) levels of distress. There were no differences in distress levels between conditions ($t(288) = -1.50$, $p = 0.13$; 95% CI [−5.45, 0.73]; $d = -0.18$), nor by strategy compliance ($t(288) = -0.84$, $p = 0.40$; 95% CI [−5.06, 2.03]; $d = -0.11$).

The mean length of participants' utility narratives was 93.91 words–about one paragraph–though there was some variation across narratives ($SD = 48.10$, range 1–297). Still, there were no differences in narrative length between conditions ($t(288) = -0.36$, $p = 0.72$; 95% CI [−13.17, 9.10]; $d = -0.04$), nor by strategy compliance ($t(288) = -0.25$, $p = 0.81$; 95% CI [−14.38, 11.17]; $d = -0.03$). Taken together, any observed differences by ER strategy or compliance are not attributable to individuals being more anxious generally, more distressed about the pandemic, or having fewer things to write about.

Utility Narrative Thematic Frequencies

Holistic Efficacy Evaluation

Table 1 provides frequencies of all coded themes from the utility narratives. Holistic efficacy differed by condition and compliance ($\chi^2(6) = 36.33$, $p < 0.001$). Those who did not comply with their strategy were also more likely to describe it as ineffective: Approximately 30% of noncompliers' narratives described their strategy as wholly ineffective, versus 10% of compliers. Just over half of all participants' narratives were coded as mixed efficacy, meaning they expressed conditionally positive beliefs or ambivalence about their strategy: A greater proportion of compliers (59–68%) than noncompliers (10–36%) were mixed. Numerically, proportions of ineffective and mixed evaluations were similar between ER conditions. Interestingly, however, effective

Table 1 Coded themes, definitions, example quotes, descriptive statistics by condition and compliance, and results of the chi-squared tests

Theme	Definition	Example	α	R, C	R, NC	M, C	M, NC	Total	χ^2	p
Holistic efficacy evaluation	The researchers' subjective evaluation as to the participants' overall sentiment regarding the strategy: either wholly effective, wholly ineffective, or mixed (meaning that they believed the strategy was conditionally effective or they described it as both effective and ineffective). Eight narratives were considered unclear and have missing values for this theme		0.83						**36.33**	**< 0.001**
Ineffective				0.10	0.28	0.09	0.30	0.14		
Mixed				0.68	0.36	0.59	0.10	0.54		
Effective				0.22	0.36	0.32	0.60	0.32		
Strategy-descriptive themes										
Stress	Explicit mention of stress, a stressor, or a synonym (e.g., anxiety) for them or a hypothetical other	"It is hard to translate feelings of stress onto schoolwork when they are unrelated to the schoolwork"	0.94	0.53 (0.50)	0.56 (0.50)	0.008 (0.09)	0.05 (0.22)	0.27 (0.45)	**101.03**	**< 0.001**
Distraction	Explicit mention of a distraction for them or a hypothetical other	"Something is either said or shown in lectures that can trigger other thoughts to occur"	0.71	0.15 (0.36)	0.09 (0.29)	0.58 (0.50)	0.45 (0.51)	0.35 (0.48)	**63.24**	**< 0.001**
Positive outcome	A specific positive outcome mentioned as a result of the strategy		0.67	0.63 (0.49)	0.35 (0.48)	0.66 (0.48)	0.25 (0.44)	0.56 (0.50)	**24.36**	**< 0.001**
Re-engage	As a result of the strategy, they or a hypothetical other experienced reengagement, refocus, or reduction of intrusive thoughts	"It helps you be aware of your intrusive thoughts and set them aside."	0.72	0.18 (0.39)	0.06 (0.23)	0.47 (0.50)	0.20 (0.41)	0.28 (0.45)	**39.77**	**< 0.001**
Utility-evaluative themes										
Motivation	Motivation (or lack thereof) to do the task or to employ the strategy		0.67	0.19 (0.40)	0.17 (0.38)	0.13 (0.34)	0.30 (0.47)	0.17 (0.37)	3.87	0.28
Interest	They or a hypothetical other need to be interested (or lack thereof, e.g., boredom) towards this task	"I did not use the strategy during the video because I was having trouble engaging with the content"	0.62	0.07 (0.25)	0.11 (0.32)	0.06 (0.23)	0.20 (0.41)	0.08 (0.27)	5.93	0.12
Tired	They or a hypothetical other would be too tired/exhausted to attempt the strategy	"I still had a little difficulty paying attention, but I think that also has to do with the fact that I feel tired right now"	0.85	0.01 (0.11)	0.02 (0.14)	0.02 (0.15)	0.10 (0.31)	0.02 (0.15)	5.59	0.13
Individual differences	Between-persons individual differences regarding strategy utility (e.g., capacity, preferences, dis/ability)	"I don't think it could be a universal strategy because people think differently, like that saying how boiled water softens the potato but hardens the egg"	0.80	0.09 (0.29)	0.11 (0.32)	0.06 (0.24)	0.40 (0.50)	0.10 (0.30)	**21.42**	**< 0.001**

Table 1 (continued)

Theme	Definition	Example	α	R, C	R, NC	M, C	M, NC	Total	χ^2	p
Conditional utility	Conditions under which strategies would be more useful		0.80	0.14 (0.34)	0.17 (0.38)	0.22 (0.42)	0.45 (0.51)	0.20 (0.40)	**10.88**	**0.01**
Practice	More useful with more practice/ experience	"So that would be on my part to commit to incorporating the strategy actively"	0.85	0.05 (0.21)	0.00 (0.00)	0.06 (0.24)	0.00 (0.00)	0.04 (0.20)	4.72	0.20
With other strategy	More useful if paired with another strategy	"I've found when coupled with compassion and honest reflection it can be a good tool"	0.75	0.01 (0.11)	0.00 (0.00)	0.00 (0.00)	0.05 (0.22)	0.01 (0.08)	6.93	0.07
Context	More useful if attempting under different temporal or environmental contexts	"It is useful, but in a distracting environment, the strategy is hard to utilize."	0.89	0.07 (0.25)	0.07 (0.26)	0.10 (0.30)	0.35 (0.49)	0.10 (0.30)	**14.86**	**0.002**

R, C is Reappraisal Compliers ($n = 89$); R, NC is Reappraisal Noncompliers ($n = 54$); M, C is Mindfulness Compliers ($n = 127$); M, NC is Mindfulness Noncompliers ($n = 20$). Superordinate themes are bolded, and where applicable, subordinate themes are in italics. Example quotes are provided for the latter. Themes are coded at the level of narrative and are not mutually exclusive. Krippendorff's alphas are reported. All codes take values 0 (absent) or 1 (present) except for Holistic Efficacy, which takes values 0 (ineffective), 1 (effective), and 2 (mixed). All chi-squared analyses have 3 degrees of freedom, except for Holistic Efficacy, which has 6

evaluations differed across conditions, with 60% of mindfulness noncompliers expressing a wholly effective evaluation of their strategy. This proportion was greater than any of the compliers' judgments as well: 22% of reappraisal compliers and 32% of mindfulness compliers described their strategy as wholly effective. Thus, an important next step was to more deeply examine participants' perceptions of mindfulness and reappraisal by analyzing what participants spontaneously mentioned about their strategies in their narratives.

Strategy-Descriptive Themes

Strategy-descriptive themes (re-engage (28%), distraction (35%), and stress (27%)) were the most frequently mentioned in participants' narratives. Chi-squared tests revealed significant differences across groups in their proportions of strategy-descriptive themes (Table 1). The clearest differences emerged when comparing across conditions and likely reflect the content of the assigned ER videos, as re-engage and distraction were mentioned more frequently for the mindfulness condition, and stress for the reappraisal condition. Take this quote from a participant assigned to mindfulness: "My mind isn't wandering as much and, despite the chaos that is happening around me, I feel much calmer." Similarly capturing the positive aspects of their condition, this reappraisal participant wrote: "I feel stressed somewhat often so looking at stress as a good thing might mean I linger on those feelings a bit less." Compliers were more likely to mention any type of positive outcome, regardless of condition.

Utility-Evaluative Themes

Though utility-evaluative themes were mentioned comparably less frequently than strategy-descriptive themes, important between-group differences emerged that better elucidated participants' evaluations of their strategies. Looking at the superordinate level, 20% of all participants mentioned conditional utility (situational, temporal, or environmental conditions under which the strategy would be more useful), 17% mentioned motivation to employ the strategy as important for its utility, and 10% mentioned individual differences that would moderate strategy utility. There were group differences in the proportion of participants mentioning individual differences ($\chi^2(3) = 21.42$, $p < 0.001$) and conditional utility ($\chi^2(3) = 10.88$, $p = 0.01$).

Mindfulness noncompliers were two to three times more likely than all others to mention conditional utility, particularly the subordinate theme of context ($\chi^2(3) = 14.86$, $p = 0.002$). In fact, 35% of all mindfulness noncompliers mentioned the context as a key moderator of the strategy's efficacy. Many, though not all, of these context mentions tended to capture whether participants found mindfulness

to be particularly suited or ill-suited for remote versus in-person educational settings. Opinions differed. For example, one individual wrote that, for mindfulness to be effective, "one must be in an environment where there is not noise." Similarly, another person assigned to mindfulness wrote that, "because being online is like focusing on a single object in which that object has many different things within it to focus on, I think this strategy is more useful for in-person/hands-on tasks." The other subordinate themes within conditional utility —practice and with other strategy —were less frequently mentioned than context. Regardless of assigned ER strategy, only compliers mentioned practice as important for strategy efficacy (e.g., "I think [reappraisal] could be useful with practice, itd be like tricking ur self to feeling happy, then it would become a habit"), though again rates of mentions were low.

Furthermore, mindfulness noncompliers were also four-to-six times more likely to mention individual differences than all others: 40% of the mindfulness noncompliers mentioned individual differences, compared to only 11% of the reappraisal noncompliers, and even fewer of those who did comply with either strategy. Though no subordinate themes were reliably identified under individual differences, patterns showed that these quotes primarily described two types of between-persons differences: First, some narratives described differences in individuals' capacities to manage the demands of the strategy (e.g., "[mindfulness is] not useful for those who [don't] do well under pressure because it will just wear them down"). The other narratives described differences in individuals' preexisting ER strategy use or preferences ("It's you at the end of the day who has to redirect your focus. It's best to practice the best way you are able to").

For the former, the most common narratives that mentioned individual differences generally described their ER strategy as good for some people but not for others (e.g., "I think it's half and half, […]. Everyone's brain thinks differently"). Some narratives provided more specificity as to who would be better suited for mindfulness. For instance, this participant described levels of mindful awareness as a key individual difference factor: "it would be good for someone who may have passing thoughts, but a lot of people go from one thought to the other without realizing and/or paying attention." Moreover, some participants mentioned individual differences pertaining to mental health challenges or dis/abilities as further important for mindfulness's efficacy. As one participant wrote after first acknowledging the benefits of mindfulness: "if you experience anxiety or perhaps another mental disorder, that may interfere with your focus and learning (it typically does with mine)." This individual implied that those without mental disorders would see greater success following mindfulness attempts.

As for the latter type of individual differences, participants' narratives tended not to elucidate specifically which alternative ER strategies they preferred; rather, they more generally reported that they or other individuals had alternative ER strategies that have worked in similar situations. As one example, one participant wrote that they did not want to change their ER approach because "it's what got me my good grades so far." Similarly, another wrote that "even though I am always distracted during class I have not ever done badly in a class which has reinforced me to not change my ways." These quotes illustrate that individuals' compliance decisions factor in their prior experiences and their prior emotion regulatory successes.

No statistically significant between-group differences emerged in participants' mentions of motivation to employ their strategies in their narratives. The subordinate motivation codes captured individuals' describing boredom or little interest in the ER context or lesson (interest: "I was not interested enough by the video to direct my stress towards it.") and/or describing how little energy they had to attempt the strategy (tired; "It was somewhat useful as I tried to use and it was working at first. I then started to get sleepy."). The former subordinate theme suggests that more engaging settings would incentivize use of their assigned ER strategy, whereas the latter suggests that these participants recognized and were disincentivized by the cognitive load of their strategy. Compared to all others, the mindfulness noncompliers were approximately two times more likely to mention these motivation themes, with the relative gap largest for tired. However, these differences did not achieve statistical significance ($ps > 0.10$).

Predicting Compliance

Given group differences in utility-evaluative themes, we explored whether these themes predicted participants' compliance on top of their condition and pandemic-related distress, which we previously found predicted compliance (Mesghina et al., 2021). We also explored which themes were most predictive of compliance. Results of the logistic regression are provided in Table 2. Unsurprisingly, mentioning positive outcome was related to a nearly four times greater probability of compliance ($p < 0.001$). Otherwise, and despite their relatively higher frequency of mention, strategy-descriptive themes were unrelated to compliance.

For the utility-evaluative themes, the logistic regression showed that only individual differences were significantly related to compliance (Table 2). Specifically, narratives that mentioned individual differences as important for their strategy's utility predicted a 69% decrease in the odds of complying ($p = 0.009$). Still, after accounting for all narrative themes, those in the mindfulness condition and those with higher pandemic-related distress remained significantly

Table 2 Results of the logistic regression analysis of strategy compliance

Predictor	Odds ratio	*SE*	*z*	95% CI	*p*
Step 1					
Mindfulness	**8.74**	**5.69**	**3.33**	**[2.44, 31.28]**	**0.001**
Pandemic distress	**1.03**	**0.01**	**2.05**	**[1.00, 1.06]**	**0.04**
Mindfulness × pandemic distress	0.97	0.02	−1.43	[0.93, 1.01]	0.15
Trait anxiety	0.98	0.01	−1.27	[0.96, 1.01]	0.20
Step 2					
Mindfulness	**8.35**	**6.22**	**2.85**	**[1.94, 35.95]**	**0.004**
Pandemic distress	**1.04**	**0.02**	**2.59**	**[1.01, 1.07]**	**0.01**
Mindfulness × pandemic distress	0.97	0.02	−1.40	[0.92, 1.01]	0.16
Trait anxiety	0.98	0.01	−1.44	[0.28, 1.22]	0.15
Stress	0.74	0.29	−0.77	[0.34, 1.59]	0.44
Distraction	1.77	0.71	1.41	[0.80, 3.88]	0.16
Positive outcome	**3.78**	**1.22**	**4.10**	**[2.00, 7.12]**	**< 0.001**
Motivation	1.00	0.38	−0.01	[0.47, 2.12]	0.99
Individual differences	**0.31**	**0.14**	**−2.61**	**[0.13, 0.75]**	**0.009**
Conditional utility	0.58	0.22	−1.43	[0.28, 1.22]	0.15

Step 1 results were reported in Mesghina et al., (2021; Study 2). Step 2 adds strategy-descriptive and utility-evaluate themes. Significant effects are bolded. Pandemic distress and trait anxiety are entered as continuous variables. All others are binary

more likely to comply with their strategy. An exploratory moderation analysis revealed that the effect of individual differences on compliance was greater for those in the mindfulness condition compared to the reappraisal condition (see Online Resource 3). Mirroring the chi-squared analyses, this suggests that compliance decisions for those in the mindfulness condition were particularly impacted by individual differences considerations.

Discussion

Reappraisal and mindfulness strategies have been highly recommended to help manage distress generally (see Creswell, 2017; Crum et al., 2020) and recently for the COVID-19 pandemic (Behan, 2020; Kwon, 2023; Van Bavel et al., 2020). Yet, evidence for compliance to both strategies has not been perfect (Banerjee et al., 2018; Lymeus et al., 2022; Mesghina et al., 2021; Opitz et al., 2015; Quach et al., 2017), nor have participants' compliance decisions when regulating ecologically valid emotions been well understood (see Aldao, 2013; Sheppes, 2020). This is particularly important given recent research suggesting ER use as assessed or self-reported in the laboratory has little to no correspondence with individuals' daily use (Burr et al., 2021; Koval et al., 2023). In this way, we take participants' noncompliance to ER strategies as a point of key theoretical importance for research on ER generally and mindfulness specifically.

We qualitatively analyzed responses to a free-response item allowing participants to explain their perceived utility of mindfulness or reappraisal after they had practiced and applied their strategies; thus, compliance decisions and responses were informed by participants' actual experience. The present analysis elucidates what individuals consider when evaluating mindfulness and reappraisal strategies for self-relevant, ongoing stressors in situ, providing ecologically valid insights for ER research (Aldao, 2013). Moreover, that participants were given an open-ended opportunity to explain their compliance adds to much of the literature that uses forced-choice designs, where selection of an ER strategy may be erroneously conflated with compliant subsequent use (see Sheppes, 2020; Sheppes & Levin, 2013 for discussions). As Banerjee et al. (2018) proposed, participants could dutifully engage in the practice, but without psychologically committing to it, mindfulness-based interventions did not produce any changes, again underscoring the importance of understanding their conceptualizations of these strategies.

Given the opportunity to evaluate their strategy's utility, only a third of participants described their strategy as wholly effective. Most expressed conditional efficacy or ambivalence, the greatest proportion of whom were compliers. Ambivalence has been a major emergent theme in qualitative analyses of undergraduates' perceptions of mindfulness (see Bamber & Schneider, 2022). Individuals' perceptions of inefficacy or conditional efficacy may stem from their initial appraisal of the strategies' purported benefits and/or costs, or stem from the individuals' unsuccessful attempts at using the strategies (Sheppes, 2020). Moreover, and interestingly, almost half of the noncompliers' narratives were categorized as effective. This suggests individuals can recognize a strategy's efficacy, and/or not be able to articulate its inefficacy,

and still choose not to use it. Thus, perceptions of overall efficacy alone cannot explain compliance decisions after selection.

An inductive, thematic analysis of participants' utility narratives allowed us to then better understand how individuals conceptualized their instructed mindfulness and reappraisal strategies, and to which considerations they attended when evaluating utility. Given the blind, exploratory coding approach, it is unsurprising that the most frequent emergent themes reflected the ER strategies' instructional content. These strategy-descriptive themes were unrelated to compliance. Rather, and more importantly, it was participants' self-generated evaluations of the utility of their assigned strategies that were related to ER condition and compliance. That mindfulness participants were more likely to comply with their strategy is in accordance with other work examining ER for personally relevant stressors, where mindfulness has been shown to have higher utilization and greater efficacy (Eisma et al., 2023; Keng et al., 2013; Pogrebtsova et al., 2018), regardless of stressor intensity (Blanke et al., 2022), patterning differently than reappraisal (Haines et al., 2016). Importantly, participants' narratives detailed under which contexts and for whom (individual differences) mindfulness would be *further* useful.

Most of the context themes in the present analysis described features of the remote learning context that were more or less conducive to mindfulness. In accordance with prior self-report and experimental prior work (Bamber & Morpeth, 2019; see also Lymeus et al., 2022; Xu et al., 2021), noise and distractions while practicing mindfulness were important features for strategy efficacy and compliance described by the noncompliers. This interestingly suggests that these students were sensitive to the same concerns about context raised in the mindfulness literature. The same could be said about motivation: participants' motivation mentions aligned with prior work underscoring the cost–benefit analysis individuals consider when employing reappraisal (Wenzel et al., 2023) and mindfulness (Xie et al., 2024; Xu et al., 2021; see Bamber & Schneider, 2022) in their daily lives. However, motivation was related to neither compliance nor condition. This could be because mentions of motivation and compliance decisions were captured concomitantly: perhaps noncompliers were not motivated to try, or those who were more motivated would try, despite perceived costs (high effort, disinterest). Moreover, one would not need to be motivated to use a strategy if they made the earlier decision to opt out of ER altogether (identification stage; see Sheppes, 2020), perhaps explaining why pandemic-related distress remained a significant predictor of compliance even after considering utility-evaluative themes like motivation. A simple but revelatory future direction would be to couple the existing compliance question with a new question asking participants if they felt the need to regulate their emotions in the first place. In any case, by studying ER after the regulatory selection and implementation stages, our work provides some additional nuance and underscores the continued need for investigations of the full, multi-step ER decision process.

The results of the logistic regression revealed that individual differences were particularly important for compliance decisions. Most of those mentioning individual differences recognized the general utility of mindfulness but their narratives (explicitly or implicitly) expressed reservations about their capacity for success after using it. As one participant wrote: "It could be useful but I don't think it could be a universal strategy because people think differently, like that saying how boiled water softens the potato but hardens the egg." Perhaps one explanation for "think[ing] differently" reflects the proposition from Banerjee et al. (2018), who found that individual differences in trait rumination and trait worry explained differences in compliance, and accordingly, improvements in mindfulness (see also Crane & Williams, 2010). This relates to qualitative accounts showing undergraduates reported that feelings of increased anxiety about mindfulness were key barriers to its efficacy (Bamber & Schneider, 2022). We assessed individuals' trait anxiety generally, which was unrelated to compliance, but did not consider the specific cognitive components of anxiety —namely, worry and rumination —that might interfere with mindfulness practice. Whichever the type of individual differences, mention of this factor was a significant and considerable predictor of compliance, suggesting further qualitative investigations that continue exploring these reservations for different emotional contexts is an important future direction.

This thematic analysis provided comparably fewer insights into why reappraisal participants were less likely to comply. This may be because, at the time of data collection, the pandemic had virtually no reappraisal affordances (Suri et al., 2018). The role of affordances has been argued in recent work where reappraisal interventions failed to produce the intended downregulatory effect on negative affect following significant personal loss (Eisma et al., 2023) and during the COVID-19 pandemic (Journault et al., 2024). Noncompliant reappraisers may have had no reason to engage with the intense, personally relevant stressor without a viable silver lining—thus, this may reflect opting out of ER altogether (Sheppes, 2020). Our thematic codes, however, provide little evidence for why noncompliant reappraisers chose differently than compliers. Further, countering prior findings (Opitz et al., 2015), individuals more distressed about the pandemic had *greater* likelihood of compliance to either strategy. This effect held even after accounting for utility-evaluative themes and trait anxiety. One reason may be that the highly intense and uncontrollable nature of COVID-19 made any ER attempt—even more effortful ones—worthwhile. Indeed, Lischetzke et al. (2022) found that perceived controllability, not perceived stress, predicted pandemic coping strategies.

Though some recent research has utilized ecologically valid measures of reappraisal and mindfulness use (Bai et al., 2020; Burr & Samanez-Larkin, 2020), these methods still do not capture individuals' reasons for their strategy selections. In the present study, this was accomplished via the blind, inductive coding of themes that emerged naturally for participants after attempting their strategies. Of course, our coding was then limited by what participants spontaneously mentioned: Features like stressor controllability (Haines et al., 2016; Lischetzke et al., 2022) and cognitive effort (Keng et al., 2013; Milyavsky et al., 2019; Sheppes & Meiran, 2008) that have been implicated in the utility and efficacy of reappraisal and mindfulness were infrequently mentioned, although motivation subordinate themes of practice and tired could plausibly be related to perceived cognitive effort. Alternatively, and importantly, this could also mean that these factors are not important to participants' ER use and immediate compliance decisions. Similarly, the with other strategy theme mirrored the recent theorizations that ER strategies have greater efficacy when used in combination (Ford et al., 2019), but this too was rare. Though these features have been shown to be important for adaptive ER, few individuals reported as much, perhaps because these are not salient to individuals during everyday ER, or because real-world ER considerations do not correspond with laboratory use (Burr et al., 2021).

In sum, when in a real-world, highly stressful context, individuals instructed to regulate their distress were more likely to comply with mindfulness than reappraisal. Additionally, open-ended responses from the mindfulness noncompliers suggest that consideration of contextual features and individual differences during strategy implementation may be important factors relevant to individuals' perceived efficacy of and compliance with mindfulness. That mention of individual differences predicted likelihood of compliance above one's level of distress is an important avenue for future research (e.g., What are the specific between-persons qualities and characteristics that individuals perceive as optimal for employing mindfulness effectively?).

More generally, it is imperative that future work continue to assess ER choice alongside individuals' rationales for their choices—particularly as they regulate their emotions in situ. This is especially important for understanding mindfulness-based interventions, which have documented high dropout and abandonment (Cavanagh et al., 2014; Goldberg et al., 2020; Sullivan et al., 2023), but when compliantly implemented show clear, large reduction effects in psychological distress (see Bamber & Morpeth, 2019). Effectively understanding compliance decisions would assist in better designing interventions that align with the decision-making processes and criteria that guide participants' use of ER strategies for real-world stressors and during key ER opportunities. At a minimum, we recommend all future ER research to ask participants whether they complied with their assigned ER strategy after instruction, in addition to whether they felt they needed to employ it in the first place. Including these simple follow-up questions would allow for more rigorous intent-to-treat analyses, which provide greater inferential validity regarding the benefits of experimental interventions, but unfortunately have not been frequently used in the mindfulness literature to date (Goldberg et al., 2017).

Limitations and Future Directions

The present study is not without limitations. First, it is presumable that those who have been previously trained on an ER strategy would be more likely to comply with it. Compared to those who are less habitually mindful or have never practiced, individuals more practiced in mindfulness reported experiencing greater reductions in stress following a mindfulness program (Laurent et al., 2015; Shapiro et al., 2011). Some emergent utility-evaluative themes (practice and with other strategy) somewhat captured individuals' prior experiences (or desire for prior experiences) with their assigned strategy, but this study would benefit from a more explicit measure of habitual use. Mindfulness-based interventions also tend to show greater efficacy when the program is longer in duration and sessions more frequently dosed (see Creswell, 2017), suggesting perceived efficacy of strategies would be greater, and compliance rates higher, if individuals were more practiced. The operationalization of compliance would also change with intervention duration as noncompliance has been identified by attrition or missing homework in weeks-long mindfulness programs (see Cavanagh et al., 2014) versus failing to use the instructed strategies in minutes-long, laboratory assessments of reappraisal (e.g., Opitz et al., 2015). Doing so would also temporally separate compliance assessment from the utility narrative prompts, mitigating potential common methods bias in our analyses (Podsakoff et al., 2012). Future studies must separately investigate how compliance changes with different ER strategies, in short- versus long-term interventions, and in laboratory versus naturalistic settings. The impacts of these factors are conflated here and would be an important extension of our findings.

Relatedly, our measure of compliance did not distinguish which aspects of the strategies participants had complied. It could be that participants attempted the strategies earnestly, but only during some of the allotted time, or only after first using a preferred alternative strategy. It could also be that participants attempted some components of the strategies (e.g., redirection of attention), but not others (mindful acceptance). Lastly, it could be that participants attempted the strategies, but stopped after unsuccessful attempts (e.g., increases in distress; see Ford & Troy, 2019; Lindsay & Creswell, 2019 for discussions on reappraisal

and mindfulness, respectively). In these hypothetical cases, participants could feasibly consider themselves out of compliance per our measure. However, their actions (stopping, switching, monitoring, maintaining ER) more closely reflect the multi-step, iterative, and non-linear processes of naturalistic ER decisions (Sheppes, 2020). We were able to show that binary compliance decisions were sensitive to ER strategy and perceived utility, but future research should measure both the quality and completeness of compliance to further understand the complexity of naturalistic ER decisions.

Other aspects possibly relevant to the measurement of compliance are individuals' tendencies to obey authority and, more generally, social desirability concerns. It is always a possibility that certain participants reported complying with their strategy because they were instructed to do so, and not because it was perceived as useful. In a similar vein, noncompliance could be a reaction to having been assigned an unwanted strategy, again independent of one's perceptions of its utility. Relatedly, other individual-level factors shown to be related to mindfulness use and efficacy were not measured —including participants' perceptions of control (Haines et al., 2016; Lischetzke et al., 2022), gender (e.g., Rojiani et al., 2017), age (e.g., Mahlo & Windsor, 2020), and personality traits (e.g., van den Hurk et al., 2011). Paired with our inductive analysis of participants' perceptions of the strategies, accounting for these between-persons factors could more fully elucidate compliance rationales, especially for individual differences themes.

Lastly, the context and sample of our investigation may limit the generalizability of our findings. We endeavored to select a stressor that was relevant to the participants' everyday lives and sufficiently distressing to warrant ER use. At the time, and for our undergraduate population of interest, concerns about the COVID-19 pandemic suited this aim well. However, Americans (Williams et al., 2020) and undergraduates (Pasquini & Keeter, 2022; Wang et al., 2020) have reported some of the greatest increases in distress in response to the COVID-19 pandemic—compliance decisions and perceived utility evaluations in this study may not generalize to adults overall, nor across nations. Moreover, the uncontrollable, novel, invisible, and potentially deadly threats of COVID-19 and its unprecedented social, academic, and economic consequences suggest this ER context may have been more distressing and intense than the typical contexts of the extant ER choice literature. Conversely, and despite high levels of general pandemic distress observed in our sample, it could be that participants' distress was not particularly salient when instructed to regulate said emotions in the moment, despite our instructions to reflect on their thoughts and feelings about the pandemic. Including a state measure of distress alongside our trait measures could more directly address ER compliance in response to current feelings.

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Data Availability With the exception of participants' full narratives, which contain identifying information, all study data are provided here: (osf.io/zn89b).

Declarations

Ethics Approval Research was conducted with the approval of the University of California, Irvine's Institutional Review Board.

Informed Consent All study participants provided informed consent.

Conflict of interest The authors declare no conflicts of interest.

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References

Aldao, A. (2013). The future of emotion regulation research: Capturing context. *Perspectives on Psychological Science, 8*(2), 155–172. https://doi.org/10.1177/1745691612459518

Bai, S., Elavsky, S., Kishida, M., Dvořáková, K., & Greenberg, M. T. (2020). Effects of mindfulness training on daily stress response in college students: Ecological momentary assessment of a randomized controlled trial. *Mindfulness, 11*(6), 1433–1445. https://doi.org/10.1007/s12671-020-01358-x

Bailey, D. H., Duncan, G. J., Murnane, R. J., & Au Yeung, N. (2021). Achievement gaps in the wake of COVID-19. *Educational Researcher, 50*(5), 266–275. https://doi.org/10.3102/0013189X211011237

Bamber, M. D., & Morpeth, E. (2019). Effects of mindfulness meditation on college student anxiety: A meta-analysis. *Mindfulness, 10*(2), 203–214. https://doi.org/10.1007/s12671-018-0965-5

Bamber, M. D., & Schneider, J. K. (2022). College students' perceptions of mindfulness-based interventions: A narrative review of

the qualitative research. *Current Psychology, 41*(2), 667–680. https://doi.org/10.1007/s12144-019-00592-4

Banerjee, M., Cavanagh, K., & Strauss, C. (2018). Barriers to mindfulness: A path analytic model exploring the role of rumination and worry in predicting psychological and physical engagement in an online mindfulness-based intervention. *Mindfulness, 9*(3), 980–992. https://doi.org/10.1007/s12671-017-0837-4

Behan, C. (2020). The benefits of meditation and mindfulness practices during times of crisis such as COVID-19. *Irish Journal of Psychological Medicine, 37*(4), 256–258. https://doi.org/10.1017/ipm.2020.38

Beltzer, M. L., Nock, M. K., Peters, B. J., & Jamieson, J. P. (2014). Rethinking butterflies: The affective, physiological, and performance effects of reappraising arousal during social evaluation. *Emotion, 14*(4), 761–768. https://doi.org/10.1037/a0036326

Birk, J. L., & Bonanno, G. A. (2016). When to throw the switch: The adaptiveness of modifying emotion regulation strategies based on affective and physiological feedback. *Emotion, 16*(5), 657–670. https://doi.org/10.1037/emo0000157

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230–241. https://doi.org/10.1093/clipsy.bph077

Blanke, E. S., Bellingtier, J. A., Riediger, M., & Brose, A. (2022). When and how to regulate: Everyday emotion-regulation strategy use and stressor intensity. *Affective Science, 3*(1), 81–92. https://doi.org/10.1007/s42761-021-00087-1

Blanke, E. S., Riediger, M., & Brose, A. (2018). Pathways to happiness are multidirectional: Associations between state mindfulness and everyday affective experience. *Emotion, 18*(2), 202–211. https://doi.org/10.1037/emo0000323

Bonanno, G. A., & Burton, C. L. (2013). Regulatory flexibility: An individual differences perspective on coping and emotion regulation. *Perspectives on Psychological Science, 8*(6), 591–612. https://doi.org/10.1177/1745691613504116

Brans, K., Koval, P., Verduyn, P., Lim, Y. L., & Kuppens, P. (2013). The regulation of negative and positive affect in daily life. *Emotion, 13*(5), 926–939. https://doi.org/10.1037/a0032400

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative Psychology, 9*(1), 3–26. https://doi.org/10.1037/qup0000196

Brunyé, T. T., Mahoney, C. R., Giles, G. E., Rapp, D. N., Taylor, H. A., & Kanarek, R. B. (2013). Learning to relax: Evaluating four brief interventions for overcoming the negative emotions accompanying math anxiety. *Learning and Individual Differences, 27*, 1–7. https://doi.org/10.1016/j.lindif.2013.06.008

Burr, D. A., Pizzie, R. G., & Kraemer, D. J. (2021). Anxiety, not regulation tendency, predicts how individuals regulate in the laboratory: An exploratory comparison of self-report and psychophysiology. *PLoS ONE, 16*(3), Article e0247246. https://doi.org/10.1371/journal.pone.0247246

Burr, D. A., & Samanez-Larkin, G. R. (2020). Advances in emotion-regulation choice from experience sampling. *Trends in Cognitive Sciences, 24*(5), 344–346. https://doi.org/10.1016/j.tics.2020.02.008

Cavanagh, K., Strauss, C., Forder, L., & Jones, F. (2014). Can mindfulness and acceptance be learnt by self-help? A systematic review and meta-analysis of mindfulness and acceptance-based self-help interventions. *Clinical Psychology Review, 34*(2), 118–129. https://doi.org/10.1016/j.cpr.2014.01.001

Crane, C., & Williams, J. M. G. (2010). Factors associated with attrition from mindfulness-based cognitive therapy in patients with a history of suicidal depression. *Mindfulness, 1*(1), 10–20. https://doi.org/10.1007/s12671-010-0003-8

Creswell, J. D. (2017). Mindfulness interventions. *Annual Review of Psychology, 68*(1), 491–516. https://doi.org/10.1146/annurev-psych-042716-051139

Crum, A. J., Jamieson, J. P., & Akinola, M. (2020). Optimizing stress: An integrated intervention for regulating stress responses. *Emotion, 20*(1), 120–125. https://doi.org/10.1037/emo0000670

Crum, A. J., Salovey, P., & Achor, S. (2013). Rethinking stress: The role of mindsets in determining the stress response. *Journal of Personality and Social Psychology, 104*(4), 716–733. https://doi.org/10.1037/a0031201

Demaree, H. A., Robinson, J. L., Pu, J., & Allen, J. J. (2006). Strategies actually employed during response-focused emotion regulation research: Affective and physiological consequences. *Cognition and Emotion, 20*(8), 1248–1260. https://doi.org/10.1080/02699930500405303

Eisma, M. C., Janshen, A., Huber, L. F., & Schroevers, M. J. (2023). Cognitive reappraisal, emotional expression and mindfulness in adaptation to bereavement: A longitudinal study. *Anxiety, Stress, & Coping, 36*(5), 577–589. https://doi.org/10.1080/10615806.2023.2165647

Erisman, S. M., & Roemer, L. (2010). A preliminary investigation of the effects of experimentally induced mindfulness on emotional responding to film clips. *Emotion, 10*(1), 72–82. https://doi.org/10.1037/a0017162

Ford, B. Q., Gross, J. J., & Gruber, J. (2019). Broadening our field of view: The role of emotion polyregulation. *Emotion Review, 11*(3), 197–208. https://doi.org/10.1177/1754073919850314

Ford, B. Q., & Troy, A. S. (2019). Reappraisal reconsidered: A closer look at the costs of an acclaimed emotion-regulation strategy. *Current Directions in Psychological Science, 28*(2), 195–203. https://doi.org/10.1177/0963721419827526

Goldberg, S. B., Imhoff-Smith, T., Bolt, D. M., Wilson-Mendenhall, C. D., Dahl, C. J., Davidson, R. J., & Rosenkranz, M. A. (2020). Testing the efficacy of a multicomponent, self-guided, smartphone-based meditation app: Three-armed randomized controlled trial. *JMIR Mental Health, 7*(11), Article e23825. https://doi.org/10.2196/23825

Goldberg, S. B., Tucker, R. P., Greene, P. A., Simpson, T. L., Kearney, D. J., & Davidson, R. J. (2017). Is mindfulness research methodology improving over time? A systematic review. *PLoS One, 12*(10), Article e0187298. https://doi.org/10.1371/journal.pone.0187298

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Haines, S. J., Gleeson, J., Kuppens, P., Hollenstein, T., Ciarrochi, J., Labuschagne, I., Grace, C., & Koval, P. (2016). The wisdom to know the difference: Strategy-situation fit in emotion regulation in daily life is associated with well-being. *Psychological Science, 27*(12), 1651–1659. https://doi.org/10.1177/0956797616669086

Hayes, A. F., & Krippendorff, K. (2007). Answering the call for a standard reliability measure for coding data. *Communication Methods and Measures, 1*(1), 77–89. https://doi.org/10.1080/19312450709336664

Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of event scale: A measure of subjective stress. *Psychosomatic Medicine, 41*(3), 209–219. https://doi.org/10.1097/00006842-197905000-00004

Jamieson, J. P., Mendes, W. B., Blackstock, E., & Schmader, T. (2010). Turning the knots in your stomach into bows: Reappraising arousal improves performance on the GRE. *Journal of Experimental Social Psychology, 46*(1), 208–212. https://doi.org/10.1016/j.jesp.2009.08.015

Journault, A. A., Cernik, R., Charbonneau, S., Sauvageau, C., Giguère, C. É., Jamieson, J. P., Plante, I., Geoffrion, S., & Lupien, S. J. (2024). Learning to embrace one's stress: The selective effects of short videos on youth's stress mindsets. *Anxiety, Stress, & Coping, 37*(1), 29–44. https://doi.org/10.1080/10615806.2023.2234309

Kaffenberger, M. (2021). Modelling the long-run learning impact of the Covid-19 learning shock: Actions to (more than) mitigate loss.

International Journal of Educational Development, 81, Article 102326. https://doi.org/10.1016/j.ijedudev.2020.102326

Keng, S. L., Robins, C. J., Smoski, M. J., Dagenbach, J., & Leary, M. R. (2013). Reappraisal and mindfulness: A comparison of subjective effects and cognitive costs. *Behaviour Research and Therapy, 51*(12), 899–904. https://doi.org/10.1016/j.brat.2013.10.006

Keng, S. L., Tan, E. L. Y., Eisenlohr-Moul, T. A., & Smoski, M. J. (2017). Effects of mindfulness, reappraisal, and suppression on sad mood and cognitive resources. *Behaviour Research and Therapy, 91*, 33–42. https://doi.org/10.1016/j.brat.2017.01.006

Koval, P., Kalokerinos, E. K., Greenaway, K. H., Medland, H., Kuppens, P., Nezlek, J. B., Hinton, J. D., & Gross, J. J. (2023). Emotion regulation in everyday life: Mapping global self-reports to daily processes. *Emotion, 23*(2), 357–374. https://doi.org/10.1037/emo0001097

Kozubal, M., Szuster, A., & Wielgopolan, A. (2023). Emotional regulation strategies in daily life: The intensity of emotions and regulation choice. *Frontiers in Psychology, 14*, Article 1218694. https://doi.org/10.3389/fpsyg.2023.1218694

Kwon, C. Y. (2023). Research and public interest in mindfulness in the COVID-19 and post-COVID-19 era: A bibliometric and Google trends analysis. *International Journal of Environmental Research and Public Health, 20*(5), Article 3807. https://doi.org/10.3390/ijerph20053807

Lalot, F., Delplanque, S., & Sander, D. (2014). Mindful regulation of positive emotions: A comparison with reappraisal and expressive suppression. *Frontiers in Psychology, 5*, Article 243. https://doi.org/10.3389/fpsyg.2014.00243

Laurent, H. K., Laurent, S. M., Nelson, B., Wright, D. B., & De Araujo Sanchez, M. A. (2015). Dispositional mindfulness moderates the effect of a brief mindfulness induction on physiological stress responses. *Mindfulness, 6*(5), 1192–1200. https://doi.org/10.1007/s12671-014-0377-0

Lindsay, E. K., & Creswell, J. D. (2019). Mindfulness, acceptance, and emotion regulation: Perspectives from monitor and acceptance theory (MAT). *Current Opinion in Psychology, 28*, 120–125. https://doi.org/10.1016/j.copsyc.2018.12.004

Lischetzke, T., Schemer, L., In-Albon, T., Karbach, J., Könen, T., & Glombiewski, J. A. (2022). Coping under a COVID-19 lockdown: Patterns of daily coping and individual differences in coping repertoires. *Anxiety, Stress, & Coping, 35*(1), 25–43. https://doi.org/10.1080/10615806.2021.1957848

Liu, J. J. W., Vickers, K., Reed, M., & Hadad, M. (2017). Re-conceptualizing stress: Shifting views on the consequences of stress and its effects on stress reactivity. *PLoS ONE, 12*(3), Article e0173188. https://doi.org/10.1371/journal.pone.0173188

Lymeus, F., White, M. P., Lindberg, P., & Hartig, T. (2022). Restoration skills training in a natural setting compared to conventional mindfulness training: Sustained advantages at a 6-month follow-up. *Frontiers in Psychology, 13*, Article 763650. https://doi.org/10.3389/fpsyg.2022.763650

Mahlo, L., & Windsor, T. D. (2020). Older and more mindful? Age differences in mindfulness components and well-being. *Aging & Mental Health, 25*(7), 1320–1331. https://doi.org/10.1080/13607863.2020.1734915

Mesghina, A., Wong, J. T., Davis, E. L., Lerner, B. S., Jackson-Green, B. J., & Richland, L. E. (2021). Distressed to distracted: Examining undergraduate learning and stress regulation during the COVID-19 pandemic. *AERA Open, 7*. https://doi.org/10.1177/23328584211065721

Milyavsky, M., Webber, D., Fernandez, J. R., Kruglanski, A. W., Goldenberg, A., Suri, G., & Gross, J. J. (2019). To reappraise or not to reappraise? Emotion regulation choice and cognitive energetics. *Emotion, 19*(6), 964–981. https://doi.org/10.1037/emo0000498

Mrazek, M. D., Franklin, M. S., Phillips, D. T., Baird, B., & Schooler, J. W. (2013). Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Psychological Science, 24*(5), 776–781. https://doi.org/10.1177/0956797612459659

Mrazek, M. D., Smallwood, J., & Schooler, J. W. (2012). Mindfulness and mind-wandering: Finding convergence through opposing constructs. *Emotion, 12*(3), 442–448. https://doi.org/10.1037/a0026678

Nardi, W. R., Elshabassi, N., Spas, J., Zima, A., Saadeh, F., & Loucks, E. B. (2022). Students' experiences of an 8-week mindfulness-based intervention at a college of opportunity: A qualitative investigation of the mindfulness-based college program. *BMC Public Health, 22*(1), Article 2331. https://doi.org/10.1186/s12889-022-14775-5

Opitz, P. C., Cavanagh, S. R., & Urry, H. L. (2015). Uninstructed emotion regulation choice in four studies of cognitive reappraisal. *Personality and Individual Differences, 86*, 455–464. https://doi.org/10.1016/j.paid.2015.06.048

Parsafar, P., & Davis, E. L. (2019). Divergent effects of instructed and reported emotion regulation strategies on children's memory for emotional information. *Cognition and Emotion, 33*(8), 1726–1735. https://doi.org/10.1080/02699931.2019.1598937

Parsafar, P., Fontanilla, F. L., & Davis, E. L. (2019). Emotion regulation strategy flexibility in childhood: When do children switch between different strategies? *Journal of Experimental Child Psychology, 183*, 1–18. https://doi.org/10.1016/j.jecp.2019.01.004

Pasquini, G., & Keeter, S. (2022). At least four-in-ten US adults have faced high levels of psychological distress during COVID-19 pandemic. Pew Research Center. https://coilink.org/20.500.12592/n7134b. Accessed 15 Oct 2024.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*, 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Pogrebtsova, E., Craig, J., Chris, A., O'shea, D., & González-Morales, M. G. (2018). Exploring daily affective changes in university students with a mindful positive reappraisal intervention: A daily diary randomized controlled trial. *Stress and Health, 34*(1), 46–58. https://doi.org/10.1002/smi.2759

Quach, D., Gibler, R. C., & Jastrowski Mano, K. E. (2017). Does home practice compliance make a difference in the effectiveness of mindfulness interventions for adolescents? *Mindfulness, 8*(2), 495–504. https://doi.org/10.1007/s12671-016-0624-7

Rojiani, R., Santoyo, J. F., Rahrig, H., Roth, H. D., & Britton, W. B. (2017). Women benefit more than men in response to college-based meditation training. *Frontiers in Psychology, 8*, Article 551. https://doi.org/10.3389/fpsyg.2017.00551

Schuster, C., Martiny, S. E., & Schmader, T. (2015). Distracted by the unthought: Suppression and reappraisal of mind wandering under stereotype threat. *PLoS One, 10*(3), Article e0122207. https://doi.org/10.1371/journal.pone.0122207

Shapiro, S. L., Brown, K. W., Thoresen, C., & Plante, T. G. (2011). The moderation of mindfulness-based stress reduction effects by trait mindfulness: Results from a randomized controlled trial. *Journal of Clinical Psychology, 67*(3), 267–277. https://doi.org/10.1002/jclp.20761

Sheppes, G. (2020). Transcending the "good & bad" and "here & now" in emotion regulation: Costs and benefits of strategies across regulatory stages. *Advances in Experimental Social Psychology, 61*, 185–236. https://doi.org/10.1016/bs.aesp.2019.09.003

Sheppes, G., & Levin, Z. (2013). Emotion regulation choice: Selecting between cognitive regulation strategies to control emotion. *Frontiers in Human Neuroscience, 7*, Article 179. https://doi.org/10.3389/fnhum.2013.00179

Sheppes, G., & Meiran, N. (2008). Divergent cognitive costs for online forms of reappraisal and distraction. *Emotion, 8*(6), 870–874. https://doi.org/10.1037/a0013711

Sheppes, G., Scheibe, S., Suri, G., & Gross, J. J. (2011). Emotion-regulation choice. *Psychological Science, 22*(11), 1391–1396. https://doi.org/10.1177/0956797611418350

Sheppes, G., Scheibe, S., Suri, G., Radu, P., Blechert, J., & Gross, J. J. (2014). Emotion regulation choice: A conceptual framework and supporting evidence. *Journal of Experimental Psychology: General, 143*(1), 163–181. https://doi.org/10.1037/a0030831

Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. *Journal of Medical Internet Research, 22*(9), Article e21279. https://doi.org/10.2196/21279

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press.

Sullivan, M., Huberty, J., Chung, Y., & Stecher, C. (2023). Mindfulness meditation app abandonment during the COVID-19 pandemic: An observational study. *Mindfulness, 14*(6), 1504–1521. https://doi.org/10.1007/s12671-023-02125-4

Suri, G., Sheppes, G., Young, G., Abraham, D., McRae, K., & Gross, J. J. (2018). Emotion regulation choice: The role of environmental affordances. *Cognition and Emotion, 32*(5), 963–971. https://doi.org/10.1080/02699931.2017.1371003

Suri, G., Whittaker, K., & Gross, J. J. (2015). Launching reappraisal: It's less common than you might think. *Emotion, 15*(1), 73–77. https://doi.org/10.1037/emo0000011

Troy, A. S., Brunner, A., Shallcross, A. J., Friedman, R., & Jones, M. C. (2018). Cognitive reappraisal and acceptance: Effects on emotion, physiology, and perceived cognitive costs. *Emotion, 18*(1), 58–74. https://doi.org/10.1037/emo0000371

Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., Druckman, J. N., Drury, J., Dube, O., Ellemers, N., Finkel, E. J., Fowler, J. H., Gelfand, M., Han, S., Haslam, S. A., Jetten, J., … Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour, 4*(5), 460–471. https://doi.org/10.1038/s41562-020-0884-z

van den Hurk, P. A. M., Wingens, T., Giommi, F., Barendregt, H. P., Speckens, A. E. M., & van Schie, H. T. (2011). On the relationship between the practice of mindfulness meditation and personality—An exploratory analysis of the mediating role of mindfulness skills. *Mindfulness, 2*(3), 194–200. https://doi.org/10.1007/s12671-011-0060-7

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health, 17*(5), Article 1729. https://doi.org/10.3390/ijerph17051729

Wenzel, M., Blanke, E. S., Rowland, Z., & Brose, A. (2023). The costs and benefits of mindfulness and reappraisal in daily life. *Affective Science, 4*(2), 260–274. https://doi.org/10.1007/s42761-022-00178-7

Williams, R. D., Shah, A., Tikkanen, R., Schneider, E. C., & Doty, M. M. (2020). Do Americans face greater mental health and economic consequences from COVID-19? Comparing the U.S. with other high-income countries. *The Commonwealth Fund*. https://doi.org/10.26099/w81v-7659

Xie, Q., Dyer, R. L., Lam, S., Frye, C., Dahl, C. J., Quanbeck, A., Nahum-Shani, I., Davidson, R. J., & Goldberg, S. B. (2024). Understanding the implementation of informal meditation practice in a smartphone-based intervention: A qualitative analysis. *Mindfulness, 15*(10), 479–490. https://doi.org/10.1007/s12671-024-02304-x

Xu, H. G., Tuckett, A., Kynoch, K., & Eley, R. (2021). A mobile mindfulness intervention for emergency department staff to improve stress and wellbeing: A qualitative study. *International Emergency Nursing, 58*,. https://doi.org/10.1016/j.ienj.2021.101039

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