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Dispositional Mindfulness Co-varies with Self-Reported Positive Reappraisal

Adam W. Hanley, BA and
The Florida State University

Eric L. Garland, PhD
University of Utah

Abstract

Emerging research suggests that mindfulness is associated with positive reappraisal and that mindfulness practice may be a means of encouraging positive reappraisal capacities. These findings, linking mindfulness with the promotion of cognitive coping strategies, challenge traditional Western conceptualizations of mindfulness as non-discursive. This study explored the relationship between dispositional mindfulness and self-reported positive reappraisal across five distinct samples: a general sample of American adults, contemplative practitioners, college students chronic pain outpatients, and alcohol dependent inpatient. Results indicate that dispositional mindfulness is positively related with self-reported positive reappraisal in all five studies as well as in an aggregated analysis combining all five studies. Furthermore, a second set of analyses statistically controlling for factors previously associated with positive reappraisal (i.e., psychological well-being, positive affect, and positive refocusing), provided evidence that mindfulness is uniquely associated with self-reported positive reappraisal. While more research is needed to refine our understanding of the relationship between mindfulness and positive reappraisal, the present investigation contributes to the growing evidence base supporting the hypothesized link between dispositional mindfulness and self-reported reappraisal by demonstrating a significant association between these constructs across a variety of samples and in the largest combined dataset on this phenomenon collected to date (N=819).

1. Introduction

As evidence supporting the salutogenic nature of mindfulness proliferates, delineating the specific mechanisms by which mindfulness exerts therapeutic benefits remains a challenge. This challenge is compounded by the fact that the term mindfulness has been alternately used in reference to a disposition, mental state, and form of meditation practice. Mindfulness

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Correspondence regarding this manuscript should be addressed to Eric L. Garland, College of Social Work and the Huntsman Cancer Institute, University of Utah, 395 South, 1500 East, Salt Lake City, UT 84112, USA, elgarlan@gmail.com, phone: +1-801-581-6192. Adam W. Hanley, BA, Educational Psychology and Learning Systems, Florida State University.
Eric L. Garland, PhD, Huntsman Cancer Institute, University of Utah

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meditation practice entails intentionally focusing attention on an object (such as the breath), while observing thoughts, emotions, and sensations as they arise in the present moment (Vago & Silbersweig, 2012). This practice is thought to engender the state of mindfulness - a state of non-judgmental, non-discursive, metacognitive awareness (Vago & Silbersweig, 2012). Dispositional mindfulness refers to the trait-like propensity to experience and express mindful qualities (e.g., nonjudgment, equanimity) and behavioral tendencies (e.g., acting with awareness rather than automaticity) (Vago & Silbersweig, 2012). Empirical evidence suggests that the practice of mindfulness meditation leads to significant increases in dispositional mindfulness (Carmody & Baer, 2008).

Given this wide range of operationalizations, it is unsurprising that a diversity of mindfulness definitions have also emerged in the literature. Although modern psychological definitions have often focused on the non-evaluative, non-conceptual aspects of mindfulness, some theorists have explicitly emphasized the role of cognition in a more secularized conceptualization of mindfulness. For example, Langer and Moldoveanu (2000) situate mindfulness as necessarily cognitive, offering their definition as “the process of drawing novel distinctions” (p. 1), which is often accompanied by the more subjective experiences of “a heightened state of involvement and wakefulness or being in the present” (p. 2). The notion that mindfulness may promote cognitive or conceptual processes is supported by some Buddhist scholars who suggest that mindfulness should be understood as the capacity to intentionally maintain attentional focus on a particular object for the ultimate aim of developing insight or wisdom (Dreyfus, 2011). In exploring the relationship between this conceptualization of mindfulness and coping with adversity, Garland (2007) offered the hypothesis that mindfulness may facilitate adaptation to adverse life circumstances by enhancing positive reappraisal, a cognitive coping strategy through which stressful events are reframed as benign, meaningful, or growth-promoting (Lazarus & Folkman, 1984). Later, Garland and colleagues (2011) specified the Mindful Coping Model (MCM), a theoretical framework outlining the proposed relational dynamics between mindfulness and positive reappraisal. As outlined in the MCM (Garland et al., 2011), mindfulness is hypothesized to facilitate disengagement from the initial stress appraisal into a metacognitive state in which thoughts about the stressor can be viewed as transitory and insubstantial, rather than veridical truths. This state is theorized to disrupt automatic frames of reference and habitual response patterns, and subsequently expand or broaden attention (i.e., *positive refocusing*) to encompass previously unattended contextual information. In turn, access to an expanded set of data allows for increased psychological flexibility and a fuller understanding of the stressful event to develop, increasing the likelihood of creating meaning or redefining the stressor in some beneficial way (i.e., *positive reappraisal*). Ultimately, this mindful reappraisal process is theorized to result in positive affect and support psychological well-being in the wake of adverse life events. Reciprocally, well-being and positive affect are theorized to broaden cognitive and attentional resources, also promoting resiliency when confronted with adversity (Fredrickson, 2004).

Emerging research supports the MCM, suggesting that a) dispositional mindfulness is linked with positive reappraisal and b) that mindfulness practice may be a means of encouraging positive reappraisal capacities. In that regard, cross-sectional surveys indicate that positive

reappraisal statistically mediates the relationship between dispositional mindfulness and diverse outcomes, such as depression (Desrosiers et al., 2013), alcohol and drug cravings (Garland et al., in press), and burnout (Gerzina & Porfeli, 2012). A prospective observational study of a large sample of persons suffering from stress-related health conditions indicated that increases in positive reappraisal statistically mediated the association between enhanced dispositional mindfulness and decreased perceived stress following participation in a MBSR course (Garland et al., 2011). A neurobiological link also appears to exist between positive reappraisal and mindfulness, such that contemplative practitioners evidence significantly reduced electrophysiological brain potential markers of negative emotion when actively reappraising compared to control subjects (Gootjes et al., 2011), and that self-reported dispositional mindfulness predicts increased prefrontal activation during reappraisal (Modinos et al., 2010). Moreover, contemplative practitioners commonly report that the practice of mindfulness helps them to positively reappraise stressful life circumstances (Hanley et al., 2013). Finally, quasi- and true experimental designs suggest that mindfulness training may enhance positive reappraisal (e.g., Bormann & Carrico, 2009; Huston et al., 2011).

The primary aim of the present investigation was to add to this growing body of literature by first examining the zero-order correlation between dispositional mindfulness and self-reported positive reappraisal in a diverse array of clinical, non-clinical, and contemplative samples across five separate studies. Taken together as a whole, analysis of data from these studies yields the largest examination of the association between mindfulness and positive reappraisal to date. It is important to emphasize that the use of the phrase positive reappraisal as employed in our studies implies self-reported positive reappraisal, in that no actual reappraisal behavior or reappraisal task (e.g., Ochsner et al., 2002) was measured. Second, with evidence of an association between positive reappraisal, well-being and positive affect (Garland et al., 2011; Helgeson et al., 2006), as well as associations between dispositional mindfulness and these constructs (Garland et al., 2011; Hanley et al., under review), we examined whether the relationship between mindfulness and reappraisal might be spurious and better explained by positive affectivity. To this end, we conducted a series of controlled analyses to test whether mindfulness remained a significant predictor of reappraisal after covarying positive affect and psychological wellbeing. Finally, in light of the presumed role of attentional processes in the MCM, we examined positive refocusing as a mediator of the association between mindfulness and reappraisal.

2. Study 1

2.1 Method

2.1.1 Participants and Procedures—Participants (N=329) were recruited from Mechanical Turk, a crowd sourcing website hosted by Amazon, are minimally compensated after successfully completing tasks. In this study, participants were paid 10¢ after completing a single online survey session including the Five Facet Mindfulness Questionnaire (Baer et al., 2006), the Cognitive Emotion Regulation Questionnaire (Garnefski & Kraaij, 2007), and the Scales of Psychological Well-Being (Ryff, 1989), that took an average of 11 minutes. A large southeastern university IRB approved this study.

The mean age for this sample was 35($SD=12.89$), and the majority of respondents were female, 227(69%). The sample was primarily Caucasian, 243(74%), Asian 35(11%) and African American 33(10%), had some college experience 271(80%), and were either single, 158(48%) or married 125(38%). Respondents most frequently reported having no religious affiliation, 128(39%), or being Protestant Christian 75(23%), Roman Catholic, 58(18%), and Other, 32(10%).

2.1.2 Measures

2.1.2.1. Dispositional mindfulness: The *Five Facet Mindfulness Questionnaire* was used to measure dispositional mindfulness (FFMQ; Baer et al., 2006). This validated scale is comprised of 39 Likert-type items tapping various facets of mindfulness: nonreactivity to inner experience, observing and attending to experience, describing and discriminating emotional experiences, nonjudging of experience, and acting with awareness. The summed items produce a total dispositional mindfulness score ($\alpha=.73$ in this sample).

2.1.2.2. Positive reappraisal: The reappraisal subscale of the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski & Kraaij, 2007) was administered to evaluate positive reappraisal. This subscale of the CERQ ($\alpha=.89$ in this sample) consists of 4 Likert-scaled items that assess how often positive reappraisal is employed to cope with stressful life events. The reappraisal subscale includes items such as “I think I can become a stronger person as a result of what happened.”

2.1.2.3. Psychological well-being: The *Scales of Psychological Well-Being* (SPWB; Ryff, 1989) were used to measure psychological well-being. This validated scale consists of 18 Likert-type items that assess six domains of well-being: self-acceptance, purpose in life, positive relationships, personal growth, environmental mastery, and autonomy. The summed items produce a total psychological well-being score ($\alpha=.85$ in this sample)

2.2 Results

In a general sample, the zero-order correlation between dispositional mindfulness and positive reappraisal was significant. The zero-order correlations between positive reappraisal and all the mindful facets were significant, with non-reacting and observing evidencing the strongest relationship with positive reappraisal (Table 1). Controlling for psychological well-being, total dispositional mindfulness remained significantly associated with positive reappraisal (Table 2).

3. Study 2

Study 1 demonstrated an association between dispositional mindfulness and self-reported positive reappraisal in a general sample of adults that was statistically independent from psychological well-being. To determine whether this relation was significant among individuals with mindfulness practice experience, we implemented a similar online survey to a convenience sample of contemplative practitioners.

3.1 Method

3.1.1 Participants and Procedures—Participants (N=130) were recruited from Mechanical Turk. In this study, only participants with a contemplative practice were paid 10¢ to complete a series of online surveys in a single session taking approximately 11 minutes. The survey included the FFMQ (Baer et al., 2006), the SPWB (Ryff, 1989), and the CERQ (Garnefski & Kraaij, 2007). Respondents were also queried as to their involvement with a contemplative practice using a single dichotomous item as well as asked to report the number of days per week in which they practiced. A large southeastern university's IRB approved this study.

The mean age for this sample was 38($SD=13.14$), and the majority of respondents were female, 97(75%). The sample was primarily Caucasian, 103(79%), Asian 11(9%) and African American 9(7%), had some college experience 118(91%), and were either single, 53(41%) or married 48(37%). Respondents most frequently reported having no religious affiliation, 35(27%), or being Roman Catholic 26(20%), Protestant Christian, 23(18%), and Other, 23(18%). Respondents reported engaging in contemplative practice on an average of 6 days a week.

3.2 Results

Among a sample of contemplative practitioners, the zero-order correlation between dispositional mindfulness and positive reappraisal was significant. The zero-order correlations between positive reappraisal and all the mindful facets were significant, with non-reacting and observing found to have the strongest relationships with positive reappraisal (Table 1). Controlling for psychological well-being, total dispositional mindfulness remained significantly associated with positive reappraisal (Table 2).

4. Study 3

Studies 1 and 2 demonstrated that the association between dispositional mindfulness and positive reappraisal was relatively consistent across contemplatives and individuals without contemplative practice. Furthermore, this association remained robust after controlling for psychological well-being. Yet, the association between mindfulness and reappraisal might also be a function of trait positive affectivity. To test this possibility, we surveyed these constructs in a sample of undergraduate students recruited for a study on coping with stress.

4.1 Method

4.1.1 Participants and Procedures—Participants (N=101) were college students recruited from a large southeastern university's College of Education research subject pool. Participants were awarded research credit for completing a survey and an experimental task (not discussed here). The survey included the FFMQ (Baer et al., 2006), the CERQ's positive reappraisal subscale (Garnefski & Kraaij, 2007), and the Positive and Negative Affect Scale short form (Watson et al., 1988). A large southeastern university's IRB approved this study.

The mean age for this sample was 22(5.64), and the majority of respondents were female, 74(73%). The sample was primarily Caucasian, 75(74%), African American 15(15%) and Latino 10(10%).

4.1.2 Measures

4.1.2.1 Positive Affect: The Positive and Negative Affect Scale short form (PANAS; Watson et al., 1988) was used to measure positive affect. Of the ten Likert-type items, the five items assessing positive emotional states (alert, inspired, determined, attentive, active) are summed to produce a total score ($\alpha=.84$ in this sample).

4.2 Results

Among this sample of college students, the zero-order correlation between total dispositional mindfulness and positive reappraisal was significant, as were zero-order correlations between positive reappraisal and the mindfulness facets of non-reactivity as well as observing internal and external experience. In contrast, describing, acting with awareness, and non-judgment were not significantly correlated with positive reappraisal (Table 1). Controlling for positive affect, total dispositional mindfulness remained significantly associated with positive reappraisal (Table 2).

5. Study 4

Findings from the previous studies indicated that dispositional mindfulness and positive reappraisal were linked in three separate samples of healthy (young) adults. Yet, mindfulness-based interventions (e.g., Mindfulness-Based Stress Reduction) are commonly used in clinical settings to treat stress-related conditions, including chronic pain syndromes. Evidence suggests that the effects of mindfulness training on reducing pain are mediated by increases in facets of dispositional mindfulness (Garland et al., 2014). Because dispositional mindfulness appears to mediate the pain reducing effects of mindfulness training, and reappraisal is a commonly used strategy to manage distress related to health stressors (Hegelson et al., 2006), in Study 4, we sought to examine the association between dispositional mindfulness and positive reappraisal among a sample of individuals seeking treatment for chronic pain conditions.

5.1 Method

5.1.1 Participants and Procedures—Participants (N=115) were recruited for a randomized controlled trial of psychological interventions for persons with chronic pain who had been treated with long term prescription opioid analgesic pharmacotherapy. Participants met study inclusion criteria if they reported recurrent pain (i.e., pain on more days than not) stemming from chronic benign (i.e., non-cancer-related) pain conditions, arthritis or fibromyalgia and had been prescribed and taken opioids for analgesia daily or nearly every day for at least the past 90 days (Chou et al., 2009). Participants were recruited between 2011–2012 from primary care clinics, pain clinics, and neurology clinics in Tallahassee, FL through posted flyers, as well as from online classified ads. Advertisements were focused on recruiting participants who suffered from, and were prescribed medicine for, chronic pain for a study focused on improving ways to address problems with chronic pain and

prescription pain medication. Participants were assessed for comorbid psychiatric disorders with the Mini-International Neuropsychiatric Interview 6.0 (Sheehan et al., 1998) and excluded if they were actively suicidal or psychotic. Participants were paid \$25 to complete a baseline assessment comprised of a series of experimental tasks and self-report questionnaires, including the FFMQ, the positive reappraisal subscale of the CERQ, and the World Health Organization Well-being Scale (Bech, 2004). A large southeastern university IRB approved this study.

More than two-thirds (68%) of participants were female (mean age=48, $SD=14$), and the majority came from lower or middle socioeconomic strata. The most common current chronic pain diagnosis reported by participants across both intervention conditions was lumbago (56.5%), followed by fibromyalgia (20.0%), arthritis (7.0%), cervicalgia (6.0%), or “other” pain conditions (10.5%). The most prevalent comorbid current psychiatric condition was major depressive disorder (68.3%), followed by generalized anxiety disorder (30.7%), alcohol use disorder (12.8%), post-traumatic stress disorder (11.9%), and substance use disorder (9.0%). Other less common comorbid conditions included OCD and social phobia. Nearly three-quarters of the sample (72.2%) met criteria for prescription opioid use disorder.

5.1.2 Measures

5.1.2.1 Well-being: Well-being was measured with the WHO-5 (Bech, 2004), comprised of five Likert-type items tapping the frequency of occurrences associated with well-being summed to produce a total score ($\alpha=.85$ in this sample).

5.2 Results

Among this sample of individuals with chronic pain, the zero-order correlation between total dispositional mindfulness and positive reappraisal was significant, as were zero-order correlations between positive reappraisal and the mindfulness facets of non-reactivity and describing emotions with words. In contrast, non-judgment, observing, and acting with awareness were not significantly correlated with positive reappraisal (Table 1). Controlling for psychological well-being, total dispositional mindfulness remained significantly associated with positive reappraisal (Table 2).

6. Study 5

While Study 4 established a significant association between mindfulness and positive reappraisal in a chronic pain patient sample, findings from this sample may or may not generalize to other clinical samples given that cognitive-affective factors may differ markedly between health and mental health conditions. Alcohol dependence often involves an obsessive attentional focus on alcohol cues, which is thought to drive craving and excessive drinking (i.e., an attentional bias, see Field & Cox, 2008). Because alcohol dependent individuals higher in dispositional mindfulness evidence enhanced ability to shift their attention away from alcohol cues (i.e., a reduced attentional bias; Garland, Boettiger et al. 2012), we hypothesized that alcohol dependent individuals higher in dispositional mindfulness would be better able to refocus their attention on positive information, and therefore would be better able to engage in positive reappraisal. Thus, we examined the

relation between mindfulness and positive reappraisal in a sample of alcohol dependent adults in long-term treatment, and sought to examine whether positive refocusing (a factor implicated in the MCM) might mediate the association between these constructs.

6.1 Methods

6.1.1 Participants and Procedures—Participants ($N=58$) had resided for 18 months in a treatment facility serving persons with alcohol and substance-use disorders. For clinical and logistical reasons, facility administrators required that residents had completed 18 months of treatment to participate in the study. Notably, 18 months marked the time of transition to employment and residence outside of the facility, and thus represents a time of heightened stress and vulnerability to relapse. Potential participants met study inclusion criteria if they were 18 years old and satisfied lifetime Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) alcohol dependence criteria as assessed with a semi-structured psychiatric interview adapted from section I of the Mini-International Neuropsychiatric Interview (Sheehan et al., 1998). Interviews were conducted by a licensed psychiatrist and licensed clinical social worker trained in making DSM-IV substance use and other psychiatric disorder diagnoses. Participants were recruited for a randomized controlled trial of psychological interventions for persons with alcohol dependence in long-term residential treatment. In this study, participants were paid \$25 upon completing a baseline assessment comprised of experimental tasks (not reported here) and a package of questionnaires including the FFMQ, and both the positive reappraisal and positive refocusing subscales of the CERQ. A large southeastern university IRB approved this study.

Study participants had resided for an average of $22.2(SD=3.6)$ months in the facility. The mean participant age was $40(SD=9.3)$. More than half of the sample was African American (55.2%), with the rest of the sample identifying themselves as Caucasian (39.7%), Latino/a (3.5%), or Native American/Alaskan Native (1.6%). Most participants were male (81%). With regard to personal income in the year before entering treatment, 56.9% had earned < \$20,000, 29.3% had earned \$20,000 to \$40,000, and 13.8% had earned > \$40,000. The mean total AUDIT score for the sample was $32.4(SD=5.6)$ and the mean number of standard alcoholic drinks consumed per day in the year before entering treatment was $18.9(SD=10.8)$ indicating that participants evidenced significant levels of alcohol dependence. All participants reported continuous abstinence from psychoactive substances during their residence in the treatment facility. Reports of abstinence were corroborated by random urinalyses conducted at the TC on an as needed basis, as well as through daily observation by program staff.

6.2 Results

In this sample of adults in long-term residential treatment for alcohol dependence, the zero-order correlation between total dispositional mindfulness and positive reappraisal was significant, as was the zero-order correlation between positive reappraisal and the mindfulness facet of describing emotions with words. In contrast, non-reactivity, non-judgment, observing, and acting with awareness were not significantly correlated with positive reappraisal (Table 1). Controlling for positive refocusing, total dispositional mindfulness remained significantly associated with positive reappraisal (Table 1).

Informed by the MCM, we explored positive refocusing as a potential mediator of the relation between dispositional mindfulness and positive reappraisal, conducting a path analysis (Baron & Kenny, 1986). Significant direct effects were observed between dispositional mindfulness, positive refocusing, and positive reappraisal; alcohol dependent individuals who reported higher levels of dispositional mindfulness reported higher levels of positive refocusing coupled with greater use of positive reappraisal. We used a bias corrected bootstrap test to determine the significance of indirect effects. The bias corrected bootstrap 95% CI indicated that the indirect effect through positive focusing was significant, $a \times b = .022$, 95% CI: (.004, .054), suggesting that positive refocusing partially mediated the association between dispositional mindfulness and positive reappraisal. The path model explained 32% of the variance in positive reappraisal.

7. General Discussion

A significant positive relationship was observed between dispositional mindfulness and self-reported positive reappraisal across five distinct samples: a general sample of American adults, contemplative practitioners, college students, chronic pain outpatients, and alcohol dependent inpatients. While the total mindfulness score as measured by the FFMQ demonstrated a relatively consistent relationship with positive reappraisal across studies, it appears that some facets of mindfulness are more closely linked with positive reappraisal than others. Specifically, the facets of non-reactivity to inner experience and describing/differentiating emotional experience were the most highly related with positive reappraisal; significant positive relationships were observed between these facets and positive reappraisal in four of the five samples. Furthermore, observing internal and external experiences was found to be positively associated with positive reappraisal in three samples. Finally, acting with awareness and maintaining a non-judgmental attitude with respect to internal and external experiences were both found to be positively related with positive reappraisal in two of the five samples, yet on the whole these were the weakest correlations observed. Taken together, study findings suggest that dispositional mindfulness is broadly related to positive reappraisal, with certain qualities of mindfulness (e.g., non-reacting and describing) appearing to be more central to this association than others (acting with awareness and non-judgment). Across a wide range of participants with diverse clinical and socio-demographic characteristics, those reporting higher levels of dispositional mindfulness were significantly more likely to report using positive reappraisal as a cognitive coping style than individuals lower in mindfulness. These results appear to be in resonance with assertions linking meditation and mindfulness with cognitive flexibility (Moore & Maliowski, 2009), and theoretically consistent with the Mindful Coping Model (Garland et al., 2011). Moreover, emerging research suggests that mindfulness training enhances working memory (Jha et al., 2010; Mrazek et al., 2013), potentially increasing the range of cognitive resources available to the practitioner during the act of reappraisal. While the nature of the present study precludes causal links, when examined in concert with other lines of inquiry, it may be that mindfulness acts in a multifaceted manner to facilitate positive reappraisal while recruiting cognitive resources supportive of the reappraisal process.

However, despite the consistent relationship between dispositional mindfulness and self-reported positive reappraisal across all samples, the facets of mindfulness most closely

related to positive reappraisal varied across the 5 samples. For the participant sets recruited online and only engaging in survey responding (i.e., studies 1 and 2), all of the mindfulness facets were positively correlated with positive reappraisal. The remaining three sets of respondents that completed surveys in person after engaging in some sort of experimental manipulation (i.e., studies 3, 4 and 5), demonstrated more targeted associations between the mindfulness facets and positive reappraisal. It may be that this discrepancy is reflective of differences between online and experimental participants. Moreover, it may be that some differences in the associations between mindfulness and positive reappraisal are the result of differential item functioning, such that those participants receiving instruction in mindfulness or engaging in a mindfulness-based interventions may interpret certain concepts and wording differently (Van Dam et al., 2009).

A second set of analyses sought to statistically control for factors previously associated with positive reappraisal, providing evidence that dispositional mindfulness is uniquely associated with positive reappraisal. In separate regression models controlling for psychological well-being, positive affect, and positive refocusing, mindfulness accounted for a significant portion of the variance in positive reappraisal scores. Although, mindfulness was not the only factor observed to predict positive reappraisal in these five samples, each model found mindfulness to be distinctly related to positive reappraisal after covarying potential confounding factors.

Hence, the association between dispositional mindfulness and positive reappraisal cannot merely be explained by trait positive affect or well-being, suggesting that mindfulness may be linked with positive reappraisal through cognitive processes. In that regard, positive refocusing was found to statistically mediate the association between mindfulness and positive reappraisal in the alcohol dependent sample. As such, this construct may partially reflect an important stage in the mindful coping model: attentional broadening to encompass previously unattended contextual information that may provide new data with which to formulate a positive reappraisal. Future investigations should explore positive refocusing as a potential mediator of the mindfulness-reappraisal relation with performance-based cognitive tasks and psychophysiological indices of this construct. In addition, if individuals reporting higher levels of dispositional mindfulness are more likely to engage in positive reappraisal, then it stands to reason that mindfulness training might enhance reappraisal by increasing dispositional mindfulness; yet, dispositional mindfulness and mindfulness practice are distinct constructs, and though dispositional mindfulness is associated with reappraisal, mindfulness practice may not be. Nevertheless, application of these findings are diverse, with emerging lines of research suggesting the importance of mindfulness and positive reappraisal with respect to clinical concerns such as substance use (Garland et al., 2014) and trauma (Joseph et al., 2012) as well as the more generalized domains of academic performance (Hanley et al., in progress) and well-being (Garland et al., 2011). Future studies could explore how participation in mindfulness-based interventions modulates the association between mindfulness and positive reappraisal.

A limitation of the present study is the reliance on self-reported measures of positive reappraisal, a construct that may be influenced by participants' desire to respond to items in a socially desirable manner. Future experimental research and clinical trials employing

direct measures of reappraisal behavior, such as a reappraisal task (e.g., Ochsner et al., 2002), could address this limitation and are needed to refine our understanding of the relation between dispositional mindfulness and positive reappraisal. The study was also limited by low internal consistency (Cronbach's alpha) for several of the mindfulness facets for the Mechanical Turk and alcohol dependent inpatient samples, as thus the zero-order correlations obtained for those particular facets cannot be considered reliable. The reappraisal alpha for the alcohol dependent sample was low yet still within the acceptable range given the fact that this scale is comprised of only four items (Churchill & Peter, 1984; Nunnally, 1978). In spite of these limitations, the present investigation contributes to the growing evidence base supporting the hypothesized link between mindfulness and reappraisal by demonstrating a significant association between these constructs across a variety of samples and in the largest combined dataset on this phenomenon collected to date (N=819). In contrast with popular conceptualizations of mindfulness as completely non-cognitive and non-evaluative, current study findings provide further support for positive reappraisal as a cognitive-evaluative mechanism of mindful positive emotion regulation that may link the non-discursive state cultivated in mindfulness practice with the discursive process of generating autobiographical meaning from an encounter with adversity.

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Highlights

We explored trait mindfulness and positive reappraisal across five distinct samples

Mindfulness is positively correlated with positive reappraisal in all five samples

Controlling related factors, mindfulness is uniquely linked to positive reappraisal

Findings support positive reappraisal as a cognitive mechanism of mindful regulation

Table 1
Dispositional Mindfulness and Positive Reappraisal Correlation Matrix Across Studies

	<i>Study 1.</i> Mechanical Turk Non- Contemplative Reappraisal N=329	<i>Study 2.</i> Mechanical Turk Contemplative Reappraisal N=130	<i>Study 3.</i> University Student Reappraisal N=101	<i>Study 4.</i> Chronic Pain Patient Reappraisal N = 115	<i>Study 5.</i> Alcohol Dependent Inpatient Reappraisal N = 58	Total Combined Sample Reappraisal N = 819
FFMQ Total	.44***	.41***	.34***	.29***	.37***	.41***
Observing	.37***	.34***	.43***	.16	-.01 ^a	.30***
Describing	.26*** ^a	.28*** ^a	.15	.24*	.41*	.28***
Acting with awareness	.26***	.21***	-.06	.09	.19	.17***
Non-judging	.24***	.16***	.12	.10	.15 ^a	.15***
Non-reacting	.47***	.38***	.52***	.21*	.16	.36***

* $p < .05$.

** $p < .01$.

*** $p < .001$.

^a = Cronbach's alpha was unacceptably low ($< .60$) for these mindfulness facets and therefore these correlations should not be considered reliable.

Table 2

Predictors of Positive Reappraisal

Variable	Study 1, Mechanical Turk Non-Contemplative		Study 2, Mechanical Turk Contemplative		Study 3, University Student		Study 4, Chronic Pain Patient		Study 5, Alcohol Dependent Inpatient	
	β		β		β		β		β	
Mindfulness	.24*		.19**		.31**		.23*		.25*	
Psychological Well-being	.29**		.33***		---		.18		---	
Positive Affect	---		---		.19*		---		---	
Positive Refocusing	---		---		---		---		.44***	
R^2	.24		.23		.14		.11		.32	
F	19.69***		48.43***		8.54***		6.63***		12.47***	

* $p < .05$.

** $p < .01$.

*** $p < .001$.

--- = Measure not administered.

Table 3

Descriptive statistics and psychometrics for measures used across studies.

	Study 1. Mechanical Turk Non-Contemplative N=329	Study 2. Mechanical Turk Contemplative N=130	Study 3. University Student N=101	Study 4. Chronic Pain Patient N = 115	Study 5. Alcohol Dependent Inpatient N = 58
Positive Reappraisal <i>M(SD)</i>	14.0(4.0)	15.1(3.9)	15.4(4.0)	13.17(4.0)	16.2(3.3)
<i>a</i>	.90	.90	.87	.89	.66
Mindfulness Total <i>M(SD)</i>	127.8(19.2)	137.8(21.2)	129.2(17.1)	115.11(16.1)	110.6(14.9)
<i>a</i>	.73	.74	.82	.89	.81
Observing <i>M(SD)</i>	27.2(5.7)	30.5(5.4)	26.5(5.8)	27.8(6.2)	26.4(7.1)
<i>a</i>	.82	.83	.74	.81	.26
Describing <i>M(SD)</i>	27.4(6.4)	29.4(6.6)	28.6(6.4)	24.9(5.4)	24.3(5.5)
<i>a</i>	.37	.37	.76	.70	.76
Acting with awareness <i>M(SD)</i>	26.3(6.6)	28.0(6.5)	25.3(6.4)	19.5(6.3)	19.5(6.5)
<i>a</i>	.90	.91	.87	.72	.73
Non-judging <i>M(SD)</i>	25.5(7.2)	27.6(7.1)	28.1(6.4)	17.8(6.1)	16.5(3.8)
<i>a</i>	.91	.91	.87	.74	.48
Non-reacting <i>M(SD)</i>	21.4(4.6)	22.5(4.6)	20.7(4.0)	21.7(5.2)	21.8(3.7)
<i>a</i>	.76	.79	.71	.82	.71
Psychological Well-being <i>M(SD)</i>	87.3(16.1) ^a	94.3(16.1) ^a	-	9.6(4.8) ^b	-
<i>a</i>	.85	.87	-	.82	-
Positive Affect <i>M(SD)</i>	-	-	14.1(4.6) ^c	-	-
<i>a</i>	-	-	.81	-	-
Positive Refocusing <i>M(SD)</i>	-	-	-	-	12.4(4.3) ^d
<i>a</i>	-	-	-	-	.81

* $p < .05$.** $p < .01$.*** $p < .001$.^a Psychological well-being was measured with the Scales of Psychological Well-Being.^b Psychological well-being was measured with the WHO-5 scale.

^c Positive affect was measured with the Positive and Negative Affect Scale.

^d Positive Refocusing was measured with the positive refocusing subscale of the Cognitive Emotion Regulation Questionnaire.