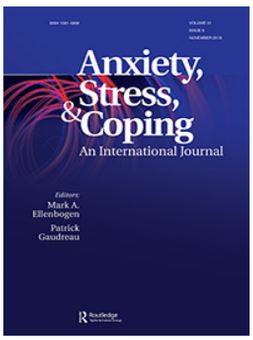

Routledge
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Anxiety, Stress, & Coping
An International Journal

ISSN: 1061-5806 (Print) 1477-2205 (Online) Journal homepage: https://www.tandfonline.com/loi/gasc20

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To cite this article: Lucy Finkelstein-Fox, Crystal L. Park & Kristen E. Riley (2018) Mindfulness and emotion regulation: promoting well-being during the transition to college, Anxiety, Stress, & Coping, 31:6, 639-653, DOI: 10.1080/10615806.2018.1518635

To link to this article: https://doi.org/10.1080/10615806.2018.1518635

Published online: 06 Sep 2018.

ANXIETY, STRESS, & COPING
2018, VOL. 31, NO. 6, 639–653
https://doi.org/10.1080/10615806.2018.1518635

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Mindfulness and emotion regulation: promoting well-being during the transition to college

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ABSTRACT

Background and Objectives: Managing stress is very important for first-year college students adjusting to undergraduate life. Aspects of emotion regulation, including mindfulness and the ability to regulate distressing emotion adaptively, often correlate positively with well-being. However, little research has examined overlapping and/or distinct effects of these constructs in predicting changes in adjustment over a stressful transition. Thus, the present study examined the contributions of mindfulness and adaptive emotion regulation abilities in maintaining well-being during the transition to college. We further examined experience with mind–body practices, which may promote mindfulness and positive adjustment.

Design: Online surveys were administered to 158 undergraduates near the beginning and end of their first semester.

Methods: Near semester start and end, students reported levels of mindfulness, adaptive emotion regulation abilities, emotional and spiritual well-being, and experience with mind–body practices.

Results: Compared to mindfulness, adaptive emotion regulation abilities largely demonstrated stronger cross-sectional and longitudinal associations with well-being. However, mindfulness uniquely protected against changes in depression for students with greater emotion regulation difficulties. Over half of participants reported having tried mind–body practices, but just 1% reported current use.

Conclusions: Promoting mindfulness practices and adaptive emotion regulation abilities at the start of college may build resilience in undergraduate students.

ARTICLE HISTORY
Received 24 August 2017
Revised 8 July 2018
Accepted 1 August 2018

KEYWORDS
Mindfulness; emotion regulation; resilience; transition; college students

The transition to college is a particularly stressful time, with many academic and social demands (Bewick, Koutsopoulou, Miles, Slaa, & Barkham, 2010). Adding to these demands, many first-year students are living on their own for the first time and must exercise adaptive self-regulation in order to care for themselves (Sallis, Owen, & Fisher, 2008). Not only are these emerging adults confronted with major stressors related to living away from home for the first time, but they are also under significant pressure to perform well in order to achieve personal and professional success later on in life (Beiter et al., 2015; Dyson & Renk, 2006). Understanding students' intrapersonal resources that promote resilience and protect psychological well-being as they transition from high school to undergraduate life may provide useful directions for campus-based counseling interventions, but much remains to be known about the ways in which various intrapersonal resources have distinct or overlapping effects on adjustment over time.

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Emotion regulation and adjustment

Most broadly, emotion regulation has been defined as a neutral process of modulating one's emotional response to the environment adaptively or maladaptively, in response to positive or negative emotion (Aldao, 2013; Gross, 1998, 2015). Individual emotion regulation practices have been addressed extensively in the literature on students' coping with stressors in college (e.g., Tamir, John, Srivastava, & Gross, 2007), with aspects of emotion regulation demonstrating direct and stress-buffering associations with well-being in many domains (Gross, 1998, 2015; John & Gross, 2004). To follow Gross' Process Model (Gross, 1998, 2015), emotion regulation includes changing an emotion-eliciting environment (i.e., situation modification), attending to and cognitively appraising environmental experiences (i.e., attention deployment and cognitive appraisal), as well as flexibly calibrating one's prior attempts at emotion regulation in order to better achieve desired goals (i.e., response modulation). As suggested by appraisal-based models of emotion (Lazarus, 1966), emotion regulation may in some cases follow and in other cases overlap with the initial generation of emotions in response to the environment. Characterological ways of interpreting one's environment may shape one's emotional experience as well as strategies subsequently deployed for emotion regulation, with these processes continuously unfolding in a feedback loop (Gross & Barrett, 2011; Gross, Sheppes, & Urry, 2011).

Mindfulness as emotion regulation

Dispositional mindfulness has been defined as comprising sustained attention, present-focused engagement, and acceptance/nonjudgment of experience, regardless of one's affective state (Chambers, Gullone, & Allen, 2009; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007). Originating in traditional Buddhist philosophy, mindfulness has gained increasing recognition in Western clinical and counseling settings since the early 1990s (Williams & Kabat-Zinn, 2011). Many studies have demonstrated that mindfulness is associated with psychological (Davis & Hayes, 2011; Jimenez, Niles, & Park, 2010; MacDonald & Baxter, 2017) and physical (Black, Sussman, Johnson, & Millam, 2012; Bodenlos, Wells, Noonan, & Mayrsohn, 2015; Murphy, Mermelstein, Edwards, & Gidycz, 2012; Roberts & Danoff-Burg, 2010) well-being in undergraduate students.

Several explanations for mindfulness' effects on well-being have been proposed, largely relating to cognitive appraisal and attentional regulation in response to emotional experience. First, at the point of generating cognitive and emotional responses to one's environment (Gross et al., 2011; Gross & Barrett, 2011), an emerging literature suggests that mindfulness is associated with generally appraising one's external stressors as less distressing and more tolerable, which often leads to improvements in affective states (Chambers et al., 2009; Palmer & Rodger, 2009; Weinstein, Brown, & Ryan, 2009). Benefits of mindfulness also appear to include reducing unnecessary attention devoted to past or future experiences and increasing focus on the present moment; recent evidence suggests that reductions in daily rumination, an important cognitive target of mindfulness interventions, may lead to lower anxiety and depression (Desrosiers, Vine, Curtiss, & Klemanski, 2014; Desrosiers, Vine, Klemanski, & Nolen-Hoeksema, 2013) as well as lower appraisals of present-moment distress and reduced reliance on maladaptive health behaviors for coping (Riley, 2015). Through promoting nonjudgmental engagement with present experience, mindfulness may increase students' ability to thrive in their immediate surroundings.

Although dispositional mindfulness is suggested to influence individuals' ability to attend to the present moment across all types of environments (Bishop et al., 2004), stress and coping researchers in particular have become increasingly interested in this construct because of its apparent association with approach-oriented strategies for regulating distressing emotion (e.g., positive reappraisal, acceptance, sustained engagement with the present moment; Bishop et al., 2004; Garland, Gaylord, & Frederickson, 2011; Weinstein et al., 2009) that often promote positive adjustment. As such, observational studies of university students have demonstrated that dispositional mindfulness is associated

with a tendency to actively engage with one's present experience and use problem-focused, as opposed to emotion-focused or avoidant, strategies for regulation (Palmer & Rodger, 2009; Weinstein et al., 2009).

Taken together, these studies suggest that mindfulness may impact psychological adjustment via initial stress appraisals and emotion generation in response to one's environment, as well as greater ability to observe and sustain engagement with emotional experience as it unfolds. However, most of the existing research has consisted of cross-sectional associations between mindfulness and positive adjustment, with very few studies measuring the extent to which mindfulness predicts change in well-being over time.

Adaptive emotion regulation abilities

In contrast to broad definitions of emotion regulation as encompassing up-and down-regulation of both positive and negative emotional states (Gross, 1998, 2015), many have conceptualized *adaptive* emotion regulation more specifically as one's ability to flexibly respond to emotional experience in a goal-oriented, situationally appropriate manner that reduces distress and promotes positive affect (Gratz & Roemer, 2004). Because college is a time when students may find themselves in a variety of demanding situations for the very first time, adaptive emotion regulation abilities in response to experiences previously appraised as upsetting or stressful are of crucial importance for these young adults.

Gratz and Roemer's (2004) definition of adaptive emotion regulation abilities is similar to mindfulness in that it relies on recognizing and acknowledging one's own thoughts and feelings, but primarily describes one's successful use of cognitive and behavioral responses to distressing emotional experience as it promotes progress toward personal goals. Within the framework of Gross' Process Model (Gross, 1998, 2015), adaptive emotion regulation abilities largely encompass cognitive and behavioral regulation abilities as well as continuous response modulation. As such, adaptive emotion regulation may overlap with mindfulness in emphasizing awareness of emotional experience, but differs in its ultimate goal of successfully *changing* an experience of emotional distress, as opposed to nonjudgmentally accepting and being present with emotion as it unfolds.

Comparing dispositional mindfulness and adaptive emotion regulation abilities

As outlined in a comprehensive review (Chambers et al., 2009), there is a notable lack of consensus in the literature as to the relationship between mindfulness and adaptive regulation abilities in response to strong emotional experience. Interventions purporting to promote adaptation of a mindful cognitive style or build one's repertoire of adaptive emotion regulation practices have both demonstrated effectiveness in modulating emotion and promoting well-being (Hofmann & Asmundson, 2008), but studies have yet to demonstrate whether these constructs comprise entirely overlapping ways of regulating emotion, or whether they are better thought of as differing points in a recursive process model of adjustment to changes in one's internal and external environment (Chambers et al., 2009; Gross, 1998, 2015).

Although possessing a mindful disposition when attending to and engaging with stressful experiences has close conceptual overlap with demonstrating adaptive emotion regulation abilities (especially in reference to practices such as engagement with distressing emotion), some research has shown that each construct should be measured as a distinct contributor to well-being because of their differential focus on non-judgmentally engaging with emotional experience versus implementing strategies to intentionally *change* an emotional state in the pursuit of personal goals (Coffey, Hartman, & Frederickson, 2010; MacDonald & Baxter, 2017; Roemer et al., 2009). Because mindful emotion regulation is typically characterized as a nonjudgmental, nonreactive approach to interpreting neutral changes in one's environment (Davis & Hayes, 2011; Desrosiers et al., 2014; Jimenez et al., 2010), it is also unclear whether high levels of mindfulness confer

benefits to individuals already possessing adaptive ability to reduce emotional distress once it arises. Adaptive emotion regulation abilities have also been highlighted as a possible mechanism through which mindfulness-based interventions lead to increased well-being (Gard, Noggle, Park, Vago, & Wilson, 2014; Garland et al., 2011; Gratz & Tull, 2010), but the degree to which mindfulness might influence emotional and spiritual health above and beyond its frequently demonstrated co-occurrence with adaptive emotion regulation ability has yet to be explored. Moving forward, it is important to understand *when* and *for whom* mindfulness and the ability to use adaptive emotion regulation may exert the greatest effects. For example, if individuals already possess sufficient adaptive emotion regulation abilities, does mindfulness exert any additional positive effects on well-being?

A holistic conceptualization of adjustment

While emotional distress is a common outcome in studies of college students, positive aspects of well-being are much less often a focus of such studies, particularly life transitions (Fredrickson, 2003). However, it is clear that stress management is crucial for maintaining low levels of distress as well as boosting positive states such as spiritual well-being (e.g., Carmody, Reed, Kristeller, & Merriam, 2008). Knowing more about resilience resources, such as mindfulness and adaptive emotion regulation abilities, and how they may influence positive as well as negative aspects of students' adjustment during periods of stress will have important implications for supporting emerging adults undergoing the major life transition of beginning college.

The present study

To follow the points outlined above regarding current models of mindfulness and emotion regulation, the primary aim of this study was to examine the role of dispositional mindfulness (including initial cognitive appraisal of one's environment and present-centered attention to emotional experience) in comparison to and interacting with adaptive emotion regulation abilities (comprising successful use of emotion regulation strategies to reduce distressing emotion) across the college transition. In contrast to previous studies that focused primarily on cross-sectional associations between mindfulness, adaptive emotion regulation abilities, and well-being, we were interested in examining the degree to which individuals' reported dispositional mindfulness and adaptive emotion regulation abilities would predict resilience to stress over time. With this goal, we set out to test the hypothesis that mindfulness would demonstrate largely overlapping contributions with adaptive emotion regulation abilities in helping students adjust, but would also prove to be particularly helpful for those students with relatively greater emotion regulation difficulties due to the distinct effects of a mindful attitude on making lower appraisals of stress when faced with new challenges and reducing problematic rumination. A full model of the hypothesized cross-sectional and longitudinal relationships between mindfulness, adaptive emotion regulation abilities, and well-being is provided in Figure 1.

Exposure to mindfulness-enhancing practices

As an extension of this central study aim, we examined students' level of experience with mind–body practices that include aspects of mindfulness (i.e., yoga with or without aspects of meditation), since little is known about the levels of yoga and meditation experience that students bring with them to college; these practices may serve as acceptable and perhaps easily-implemented targets for intervention. A systematic review of complementary and alternative medicine (CAM) practices among U.S. college students suggested that yoga may be particularly acceptable to students, with a significantly larger annual prevalence rate of yoga practice endorsed by college students (18%) than that reported in the general population (6%; Barnes, Bloom, & Nahin, 2008) during approximately the same time period (Versnik Nowak & Hale, 2012). In contrast, the same review noted that weighted averages of meditation practice, when assessed separately, are similar in college student (11%) and general

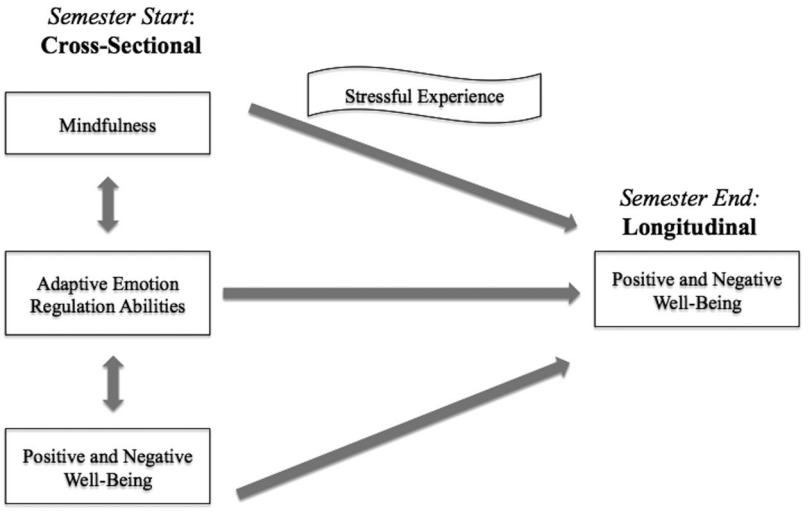

Figure 1. Hypothesized associations of mindfulness, adaptive emotion regulation abilities, and well-being.

population (9%; Barnes et al., 2008) samples (Versnik Nowak & Hale, 2012). Further, a more recent survey of CAM use in undergraduate and graduate students reported that as many as 38% of students practice yoga, and 24% practice meditation once or more annually (Versnik Nowak et al., 2015). Given the shared aspects of yoga and meditation practice as well as their increasing availability in the U.S. in the past several years (Yoga Journal & Yoga Alliance, 2016), additional data clarifying the frequency with which students have tried and are regularly using these practices is warranted.

Method

Procedure

Study participants were recruited via the Psychology Department participant pool at the University of Connecticut to participate in a study of the ways in which stress impacts health and well-being during the first semester of college. Participants completed online surveys in September and November of their first semester in exchange for participation credit for an introductory psychology course. All measures were administered both at the start and end of the first semester. All study procedures were approved by the Institutional Review Board at the University of Connecticut.

Participants

Participants were 158 first-year undergraduate students at the University of Connecticut. The majority was female (80%), with a mean age of 17.83 ($SD = 0.50$) at the beginning of the study. Seventy-nine percent of participants endorsed being White, 12% Asian/Asian American, 4% African American, and 4% "Other." Ninety-nine percent reported non-Hispanic ethnicity.

Measures

Mindfulness

Mindfulness was assessed with the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al., 2007). The CAMS-R measures a single, second-order construct of mindfulness

comprising attention, present-focus, awareness, and acceptance and is designed for use by populations who are inexperienced with mindfulness and meditation. Items query ways in which individuals generally appraise their environment and maintain present-moment engagement with all types of situations, thoughts, and emotions (i.e., cognitive appraisal and attentional regulation; Gross, 1998, 2015). This measure has demonstrated good convergent validity with other measures of mindfulness, especially those emphasizing cognitive acceptance of negative emotion (Feldman et al., 2007). The CAMS-R consists of 12 items, rated 1 (Rarely/Not at all) to 4 (Almost always). The CAMS-R demonstrated good psychometric properties in a college student sample (Feldman et al., 2007). Participants' scores on the CAMS-R were taken as the mean of all responses. Cronbach's alpha in the present sample was .70 (good).

Adaptive emotion regulation abilities

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) measured participants' adaptive emotion regulation abilities at the beginning of the semester. The DERS comprises six subscales of emotion regulation: 1) Nonacceptance of emotional responses (6 items); 2) Difficulties engaging in goal-directed behavior (5 items); 3) Impulse control difficulties (6 items); 4) Lack of emotional awareness (6 items); 5) Limited access to emotion regulation strategies (8 items); 6) and Lack of emotional clarity (5 items). Total DERS scores have demonstrated good reliability and validity in North American undergraduate and community samples (Gratz & Roemer, 2004). In contrast to the CAMS-R, which focuses primarily on cognitive appraisals and attentional reguation (independent of emotional valence), the DERS is primarily focused on participants' experience of emotional states that are already underway and the ways in which they adaptively respond to their initial emotional response in a way that ultimately reduces distress. The DERS has 36 items, rated 1 (Almost never) to 5 (Almost always). Participants' total scores on the DERS were taken as the sum of all responses; scores were then multiplied by −1 to represent adaptive emotion regulation rather than difficulties with emotion regulation. Cronbach's alpha for DERS total score in the present sample was .94 (excellent).

Depression, anxiety, and stress

The Depression, Anxiety, and Stress Scales, 21-item version (DASS-21) were administered to assess psychological well-being. The DASS-21 is a shortened version of the original 42-item DASS (Lovibond & Lovibond, 1995), and has demonstrated good reliability and validity in racially diverse undergraduate student samples (Norton, 2007). Total scores are obtained by adding up responses to all items and multiplying the total scores by two. Seven items of the DASS-21 relate to depression, seven to anxiety, and seven to stress; each item is rated on a scale of 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). Cronbach's alphas for depression, anxiety, and stress in the present sample were .87, .78, and .85 at baseline and .86, .84, and .83, respectively, at semester end (all acceptable or good).

Spiritual well-being

The FACIT-Sp-Non-Illness version (Bredle, Salsman, Debb, Arnold, & Cella, 2011; Peterman, Fitchett, Brady, Hernandez, & Cella, 2002) was administered to assess spiritual well-being. The FACIT-Sp has been shown to be reliable and valid (Peterman et al., 2002) and has been used extensively with both clinical and non-clinical populations. The FACIT-Sp consists of three 4-item subscales: Meaning, Peace, and Faith. Cronbach's alphas for the Meaning, Peace and Faith subscales in the present sample were .84, .81, and .84 at baseline, and .84, .84 and .88, respectively, at semester end (all good or excellent).

Mind–body practice

Experience with mind–body practice was assessed using four questions regarding experience with yoga and meditation. Participants were asked whether they had ever practiced "yoga (including

meditation)" in their lifetime, the number of times they had practiced in the past year, whether they had a current weekly practice (once or more weekly), and if so, how many times per week they practiced. Given the literature suggesting that meditation is an important self-regulatory mechanism of yoga (e.g., Gard et al., 2014), we phrased this item in such a way that participants would be prompted to report on both aspects of their practice.

Analysis

A priori power analysis suggested that a sample of 150 would provide approximately 80% power to detect small to medium interaction effect sizes; thus, the present sample provided sufficient power for the proposed analyses. Data cleaning, inspection, and preliminary analyses were performed using SPSS Version 23 (IBM Corp). Correlation and regression analyses were performed in R, using multiple data imputation to account for missing data (mice package; van Buuren & Groothuis-Oudshoorn, 2011). Significant interaction effects were probed with an online tool (Preacher, Curran, & Bauer, 2006), using covariance matrices and associated parameter estimates extracted from the first of five imputed datasets.

Preliminary data analyses included an examination of sample characteristics, attrition over time, and distributions of the independent and dependent variables. Bivariate (cross-sectional) correlations were also conducted between the CAMS-R, DERS, and subscales of the DASS-21 and FACIT-Sp. Using separate linear regression models, we analyzed the combined and interactive effects of CAMS-R and DERS at the beginning of the semester on anxiety, depression, stress, and spiritual well-being at the end of the semester, thus capturing change over time. Given our interest in examining the effects of mindfulness and adaptive emotion regulation on changes in well-being over the course of a stressful transition, all multiple regression models controlled for baseline levels of symptomatology and used well-being scores at semester end as the dependent variable.

Results

Seventeen individuals completed surveys at semester start but failed to complete surveys at semester end, and 12 participated at semester end only; thus, a total of 129 individuals provided data at both time points. Chi square and t-test analyses comparing study completers to non-completers indicated that the 17 individuals who failed to complete follow-up surveys did not differ significantly from study completers on age, gender, race, or any of the predictor or well-being variables. Similarly, no significant differences were found for the 12 students who completed surveys at semester end only. Examination of missing data patterns suggested that data were missing at random (Little & Rubin, 2002), largely due to participant attrition.

A close examination of data for potential outliers revealed that approximately 5% of participants reported distress scores (DASS-21 subscales and FACIT-Sp meaning subscale) at or above 2.24 standard deviations greater than the sample mean (Aguinis, Gottfredson, & Joo, 2013). Because these scores were within a reasonably expected range (Lovibond & Lovibond, 1995) and did not appear to have been entered in error, we felt that these participants added important information to our data and chose to retain their scores for the present analyses. Models were also run without these participants to examine potential differences in outcomes (Aguinis et al., 2013); except where noted below, interpretation of results was unchanged.

Sample characteristics

Descriptive analyses of the independent and dependent variables are summarized in Table 1. Depression and stress scores for our sample fell into the normal range at baseline and semester end, as established in the validation sample for the DASS. When rounded to the nearest integer, anxiety scores at baseline and semester end fell into the moderate range (Lovibond & Lovibond,

1995). Average FACIT-Sp meaning, peace, and faith scores also fell into the expected ranges for a college student sample at baseline and semester end (Park, 2017). Average meaning and faith scores decreased significantly over the course of the semester, but no other well-being measures demonstrated significant change across the study sample.

Relative associations of mindfulness and adaptive emotion regulation abilities with well-being

Cross-sectional associations

Bivariate, cross-sectional correlations of mindfulness and adaptive emotion regulation abilities with depression, anxiety, stress, meaning, peace, and faith at semester start are reported in Table 2. Steiger tests indicated that adaptive emotion regulation abilities had a significantly stronger cross-sectional association with depression, anxiety, and stress at semester end than did mindfulness (depression $z = 4.28$, anxiety $z = 4.77$, stress $z = 4.65$, $ps < .001$). In contrast, mindfulness and adaptive emotion regulation abilities were not significantly differently associated with meaning, peace or faith (meaning $z = 0.16$, peace $z = -1.34$; faith $z = 1.38$, $ps > .10$). Scores on mindfulness and adaptive emotion regulation abilities were positively correlated.

Longitudinal associations

Results of linear regression models predicting person-level changes in depression, anxiety, stress, meaning, peace and faith from mindfulness and adaptive emotion regulation abilities, as well as their interaction, are reported in Table 3. Regression diagnostics for each model showed that no variance inflation factors for mindfulness and adaptive emotion regulation abilities were greater than 2, well below the threshold for problematic multicollinearity (Tabachnick & Fidell, 2001).

In models including baseline levels of DASS-21 and FACIT-Sp scores along with mindfulness and emotion regulation together, mindfulness was a non-significant predictor of changes on all measures. In contrast, adaptive emotion regulation abilities at baseline demonstrated protective effects against increases in depression, anxiety, and stress and decreases in spiritual peace. When added after main effects, the interaction of mindfulness and adaptive emotion regulation abilities had a small but significant effect on depression, but not anxiety, stress, meaning, peace, or faith at semester end (see Table 3). To examine the significant interaction of mindfulness and adaptive emotion regulation abilities on depression, predicted values were plotted for individuals with average, one standard deviation above, and one standard deviation below average emotion regulation scores, as suggested

Table 1. Description of independent and dependent variables.

Variable	Time 1 Mean (*SD*)	Time 2 Mean (*SD*)	Mean comparison	95% CI of difference
Mindfulness	2.58 (0.47)	2.55 (0.56)	$t(127) = 0.21$, $p = .83$, $d = 0.02$	[−0.07, 0.08]
Adaptive emotion regulation abilities	−89.95 (23.44)	−90.77 (23.01)	$t(107) = 0.90$, $p = .37$, $d = 0.07$	[−4.90, 1.84]
Depression	8.05 (8.11)	8.59 (8.23)	$t(127) = -0.64$, $p = .52$, $d = -0.05$	[−1.53, 0.78]
Anxiety	9.77 (8.16)	9.71 (8.40)	$t(127) = 0.05$, $p = .96$, $d = 0.00$	[−1.32, 1.38]
Stress	12.59 (9.06)	11.86 (8.40)	$t(127) = 1.08$, $p = .28$, $d = 0.09$	[−0.64, 2.17]
Meaning	11.85 (2.94)	11.00 (3.21)	$t(121) = 4.16$, $p < .001$, $d = 0.29$	[0.46, 1.30]
Peace	8.24 (3.39)	8.39 (3.43)	$t(116) = -0.61$, $p = .55$, $d = -0.05$	[−0.69, 0.37]
Faith	7.71 (4.35)	7.17 (4.50)	$t(126) = 2.19$, $p = .03$, $d = 0.17$	[0.07, 1.38]

Table 2. Bivariate correlations of cognitive strategies and well-being at time 1 ($N = 158$).

Variables	1	2	3	4	5	6	7	8
1. Mindfulness	1							
2. Adaptive emotion regulation abilities	.56***	1						
3. Depression	−.42***	−.67***	1					
4. Anxiety	−.26***	−.57***	.69***	1				
5. Stress	−.41***	−.68***	.76***	.70***	1			
6. Meaning	.47***	.48***	−.59***	−.38***	−.41***	1		
7. Peace	.59***	.51***	−.51***	−.33***	−.52***	.63***	1	
8. Faith	.19*	.29*	−.23**	−.22*	−.18	.36***	.33***	1

*$p < .05$, **$p < .01$, ***$p < .001$.

by Aiken and West (1991). Simple slopes analysis revealed that higher levels of mindfulness predicted significant reductions in depression for those with low emotion regulation abilities (B = −3.36, $\beta = -0.24$, $p = .03$), whereas individuals with moderate (B = −0.94, $\beta = -0.09$, $p = .42$) and high (B = 1.48, $\beta = 0.06$ $p = .33$) levels of emotion regulation abilities did not have a significant effect of mindfulness on depression (see Figure 2). Specifically, region of significance analyses indicated that mindfulness would significantly relate to depression ($p < .05$) for individuals with scores of greater than 108 on the DERS. Of note, the interaction between mindfulness and adaptive emotion regulation abilities was no longer statistically significant when removing individuals with high levels of depression from the analysis.

Table 3. Hierarchical linear regression models predicting well-being over time ($N = 158$).

	Model 1				Model 2			
	B	SE B	95% CI	β	B	SE B	95% CI	β
Depression								
T1[a] Depression	0.40	0.09	[0.21, 0.58]	0.39***	0.37	0.09	[0.19, 0.55]	0.36***
Mindfulness	−0.84	1.55	[−3.91, 2.23]	−0.05	−1.50	1.56	[−4.58, 1.59]	−0.09
Adaptive ER[b]	−0.13	0.04	[−0.20, −0.05]	−0.36**	−0.12	0.04	[−0.19, −0.05]	−0.34**
Mindfulness × Adaptive ER[c]					0.11	0.05	[0.01, 0.21]	0.15*
Anxiety								
T1 Anxiety	0.45	0.10	[0.25, 0.64]	0.44***	0.45	0.10	[0.25, 0.65]	0.44***
Mindfulness	−1.49	1.88	[−5.21, 2.22]	−0.08	−1.69	1.92	[−5.49, 2.10]	−0.10
Adaptive ER	−0.08	0.04	[−0.16, 0.01]	−0.22^	−0.07	0.04	[−0.16, 0.01]	−0.21^
Mindfulness × Adaptive ER					0.03	0.06	[−0.09, 0.16]	0.05
Stress								
T1 Stress	0.33	0.09	[0.14, 0.52]	0.36***	0.33	0.10	[0.14, 0.51]	0.35***
Mindfulness	−0.42	1.73	[−3.85, 3.01]	−0.02	−0.54	1.77	[−4.05, 2.97]	−0.03
Adaptive ER	−0.12	0.04	[−0.20, −0.04]	−0.33**	−0.12	0.04	[−0.20, −0.03]	−0.32**
Mindfulness × Adaptive ER					0.02	0.06	[−0.09, 0.13]	0.03
Spiritual meaning								
T1 Meaning	0.68	0.09	[0.51, 0.86]	0.62***	0.68	0.09	[0.51, 0.86]	0.63***
Mindfulness	0.34	0.65	[−0.95, 1.64]	0.05	0.26	0.67	[−1.06, 1.59]	0.04
Adaptive ER	0.01	0.01	[−0.01, 0.04]	0.08	0.01	0.01	[−0.01, 0.04]	0.09
Mindfulness × Adaptive ER					0.01	0.02	[−0.03, 0.05]	0.04
Spiritual peace								
T1 Peace	0.55	0.10	[0.35, 0.74]	0.54***	0.55	0.10	[0.35, 0.74]	0.54***
Mindfulness	−0.19	0.81	[−1.80, 1.42]	−0.03	−0.14	0.83	[−1.79, 1.51]	−0.02
Adaptive ER	0.03	0.01	[0.01, 0.06]	0.24*	0.03	0.01	[0.01, 0.06]	0.23*
Mindfulness × Adaptive ER					−0.01	0.03	[−0.06, 0.04]	−0.03
Spiritual faith								
T1 Faith	0.66	0.08	[0.50, 0.82]	0.64***	0.66	0.08	[0.50, 0.82]	0.64***
Mindfulness	−0.11	0.95	[−2.00, 1.78]	−0.01	0.12	0.97	[−1.80, 2.04]	0.01
Adaptive ER	0.01	0.02	[−0.03, 0.05]	0.05	0.00	0.02	[−0.03, 0.04]	0.02
Mindfulness × Adaptive ER					−0.04	0.03	[−0.10, 0.02]	−0.10

^$p < .1$, *$p < .05$, **$p < .01$, ***$p < .001$.
[a]T1 = Time 1 (semester start)
[b]Adaptive ER = Adaptive emotion regulation abilities
[c]Predictors were centered at their means and multiplied to create the interaction term.

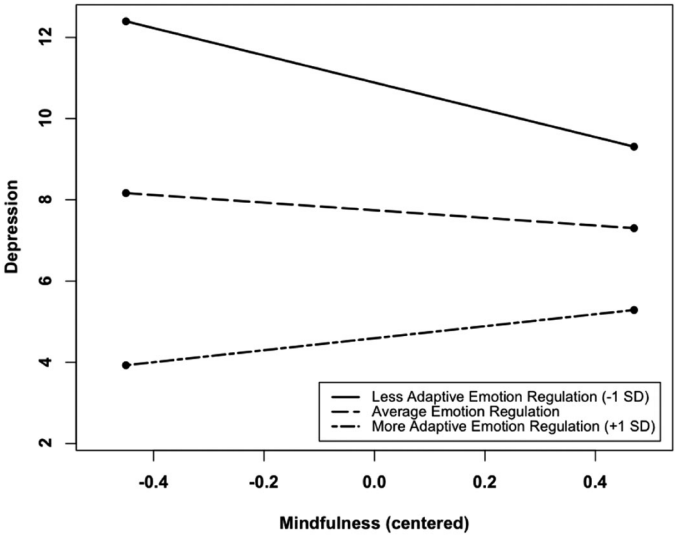

Figure 2. Interaction of mindfulness × adaptive emotion regulation abilities on depression at semester end.

Experience with yoga practice

Characteristics of participants' experience with yoga and meditation practice are reported in Table 4.

Discussion

The primary aim of the present study was to better understand the relative and interactive effects of mindfulness and adaptive emotion regulation abilities on emotional and spiritual well-being. Our hypothesis that mindfulness and adaptive emotion regulation abilities would be similarly protective of well-being for students during a stressful transition, and that mindfulness would be especially useful for those demonstrating difficulties regulating distressing emotion was supported only in part, with adaptive emotion regulation abilities demonstrating stronger links with almost all well-being outcomes cross-sectionally and longitudinally, and mindfulness accounting for additional variance only in the model predicting changes in depression. Additionally, we explored the prevalence of yoga, a mindfulness-enhancing practice, among the first-year college students who took part in this study. Results revealed that slightly more than half of students had tried yoga at least once, but only a very small number (∼1%) reported a current weekly practice.

Self-reported depression, anxiety, stress, meaning, peace, and faith levels appeared to fall within the range typically seen in non-clinical college student samples (Lovibond & Lovibond, 1995; Norton, 2007; Park, 2017). Thus, the results of the present analysis are likely generalizable to similar groups. Further, there was no group-level change on our measures of emotional well-being as students progressed through their first semester, with variation depending primarily on person-level differences. However, first-year students did, on average, experience small decreases in meaning and religious

Table 4. Characteristics of mind-body practice at semester start.

Practice frequency	%	*N*	
Practiced once or more in lifetime	57	81	
Practiced once or more in past year	49	69	
Practices one or more days weekly	1	2	
If weekly practice	Mean	*SD*	Range
Number of days practiced per week	1.50	0.50	1–2

faith along over the course of the semester. Similar to previous cross-sectional studies (e.g., Jimenez et al., 2010; Roemer et al., 2009), both mindfulness and adaptive emotion regulation abilities appear to be strongly positively related to one another as well as negatively related to emotional distress, and positively related to spiritual well-being. Further, results suggest that that adaptive cognitive and behavioral emotion regulation abilities may be a stronger indicator of concurrent emotional well-being adjustment at any given time than is dispositional mindfulness. Previous research has suggested that mindfulness is associated with attention to and sustained engagement with both positive *and* negative experience (Bishop et al., 2004; Desrosiers et al., 2014; Medina, Hopkins, Powers, Baird, & Smits, 2015), and so these results may be indicative of the fact that mindfulness is linked to nonjudgmental awareness and acceptance of distress as well as positive mood states.

Entered simultaneously into regression models predicting within-person change, only adaptive emotion regulation abilities predicted changes in depression, anxiety, and stress symptoms over the course of the semester. Although we were unable to examine time-lagged process models due to the design of the present study, these results may be interpreted in the context of previous cross-sectional research suggesting that the effects of mindfulness and adaptive emotion regulation abilities on emotional well-being during periods of objectively challenging transitions (e.g., beginning college) are largely overlapping, perhaps due in part to mindful attention to experience facilitating greater engagement with adaptive emotion regulation abilities (Coffey et al., 2010; Desrosiers et al., 2014; MacDonald & Baxter, 2017; Roemer et al., 2009). However, future longitudinal research is needed to test these hypotheses across various types of potentially stressful environments.

In addition, only emotion regulation significantly predicted small changes in peace, and neither predicted changes in levels of meaning or faith; thus, these markers of positive adjustment may be less impacted by active, adaptive emotion regulation abilities and perhaps even exert some protective effects against emotional distress (Fredrickson, 2003). These results also lend support to the hypothesis that changes in spiritual well-being among young adults undergoing a stressful transition may be relatively unrelated to self-regulation abilities, and may be more strongly tied to changes in worldviews as students gain exposure to differing viewpoints in a university environment (Gutierrez & Park, 2015). Further, because our results showed that adaptive emotion regulation abilities protected against reductions in peace, but not other measures of spiritual well-being, it will be important for future work to examine other variables that might protect against decreases in perceived meaning and faith.

To assess whether mindfulness would have a greater effect on change in well-being for individuals with lower levels of adaptive emotion regulation abilities, we examined the interaction effect of mindfulness and adaptive emotion regulation abilities on all well-being measures. The small but significant effect of the interaction of mindfulness and adaptive emotion regulation abilities on predicting changes in depression indicates that although mindfulness and adaptive emotion regulation abilities appear to make similar contributions to well-being, mindfulness may be of particular benefit to students who have difficulty regulating emotion in response to appraisals of distress. To follow the framework of emotion regulation suggested by Gross' Process Model (Gross, 1998, 2015) we might interpret this finding as suggesting that because dispositional mindfulness is associated with cognitive appraisal of one's environment and attentional regulation of emotional experience, students who struggle to adaptively regulate emotional distress may be at less of a disadvantage if they mindfully appraise experiences as less distressing and more tolerable.

These results have important implications for the development of stress-management interventions targeting college student populations: mindfulness and adaptive emotion regulation abilities appear to have largely overlapping effects on protecting well-being during periods of stress, but there may also be unique aspects of mindfulness that can benefit individuals with particularly high levels of emotion regulation difficulties from experiencing increases in depression. Of note, the interactive effect of mindfulness and adaptive emotion regulation abilities was not significant in models predicting anxiety, stress, meaning, peace, and faith. Thus, even when individuals struggle to regulate emotions adaptively, mindfulness does not appear to have a significant effect above and

beyond the impact of adaptive emotion regulation abilities on these measures of well-being in our student sample, although distinct contributions of these variables have been observed in clinical samples (Roemer et al., 2009). Future research should incorporate more detailed measures of the specific mechanisms of mindfulness, such as nonjudgmental acceptance of and attention to the present moment (Coffey et al., 2010; Jimenez et al., 2010), positive reappraisal (Garland et al., 2011), or decreases in ruminative cognitions (Riley, 2015), all of which have been closely linked to depression (Chambers et al., 2009; Desrosiers et al., 2013, 2014) and may help to explain these effects.

Finally, it appears that mindfulness-based interventions may be acceptable and timely in college student samples. Reported rates of yoga practice in the past year (49%) were higher than the 38% annual prevalence rate of yoga practice recently reported by Versnik Nowak et al. (2015), which may be due in part to the fact that our question asked about "yoga (including meditation)" rather than using the term "yoga" alone, which is often taken to refer specifically to asana-based practice. In addition, our study sample comprised mostly White female first-year students hailing from the Northeastern United States; all of these characteristics have been shown to predict higher levels of yoga practice in a variety of samples (Park, Braun, & Siegel, 2015). Still, very few (1%; $n = 2$) endorsed practicing once or more weekly; thus, only a small number of first-year undergraduates appear to be regularly garnering the affective benefits that research has shown can result from regular yoga practice (Gard et al., 2014). Future research should use longitudinal methods to establish the utility of these practices in promoting effective self-regulation.

Implications for counseling and campus-based interventions

Given the largely overlapping beneficial effects of mindfulness and adaptive emotion regulation abilities in the present sample, interventions that aim to increase mindfulness as well as those that aim to increase adaptive emotion regulation abilities, such as traditional cognitive behavioral therapy, may both be useful. These findings are consistent with a meta-analysis on stress-reduction interventions in college students suggesting that mindfulness-based, cognitive, and behavioral interventions have all demonstrated efficacy in this population (Regehr, Glancy, & Pitts, 2013).

Importantly, the findings that mindfulness may be particularly helpful for those who demonstrate difficulties with emotion regulation suggest that increased availability of mindfulness-promoting interventions, such as yoga and meditation programming, might be beneficial for first-year undergraduates. As suggested by previous studies (Gard et al., 2014; Medina et al., 2015; Park et al., 2017), use of mindfulness-based practices may increase individuals' mindful cognitive approach to their present experiences, thus reducing ruminative tendencies, increasing positive appraisals of stress, and perhaps facilitating adaptive emotion regulation abilities in response to initial appraisals of distress. Mindfulness interventions may be feasible alternatives to interventions traditionally used to target emotion regulation alone, such as cognitive behavioral interventions, especially as yoga is increasing in popularity among college students (Park et al., 2015). To this point, a recent study demonstrated that college student participants rated a yoga-based stress management intervention as preferable to a cognitive behavioral stress management intervention (Park et al., 2017). From a programming perspective, these interventions are relatively inexpensive and easily implemented (e.g., Falsafi, 2016). Given the growing literature suggesting that these interventions may be acceptable to students, counseling centers may wish to consider them as complementary or alternative options for students undergoing stressful transitions.

Limitations

Because our sample was drawn from students enrolled at the University of Connecticut, the majority of whom are White and have grown up in relatively financially stable settings in the Northeastern United States, these results may not be entirely generalizable to all young adults. The fact that these students have successfully enrolled in a university setting also indicates that they may have

developed more adaptive regulation abilities in comparison to the general population; we might expect that these young adults are better prepared to handle the transition to college than are individuals with lower levels of resources. In addition, the present analyses were conducted with data from two data points: semester start and end. Because stress levels are highly dependent on a multitude of individual differences that may even change from day to day, it will be important for future studies to look more deeply into within- as well as between- participant differences in stress management. Other limitations of the study sample include the imbalance of female and male respondents; as is typical of research conducted with psychology undergraduate students (Barlow & Cromer, 2006), 79% of participants in the present sample were female.

Conclusion

Taken together, the findings of the present study suggest that mindfulness and adaptive emotion regulation abilities represent related but perhaps functionally distinct constructs with unique effects on well-being depending on individual differences in cognitions and regulation abilities. Specifically, results demonstrated that for individuals with emotion regulation difficulties, mindfulness may promote resilience beyond its overlapping contributions with adaptive emotion regulation abilities; for individuals reporting adaptive emotion regulation abilities, mindfulness did not significantly predict successful adjustment to college. These findings should be interpreted in the context of the low rates of experience with mindfulness-based practices reported as well as the non-clinical nature of this sample. Future research is warranted in other types of college student samples to better understand how mindfulness and adaptive emotion regulation abilities might contribute to stress-management during major life transitions.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

Dr. Riley was supported in part by the National Cancer Institute's Support/Core Grant to Memorial Sloan Kettering Cancer Center (P30 CA008748) as well as a training grant to Memorial Sloan Kettering Cancer Center (T32 CA009461).

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