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The role of two emotion regulation tendencies across two waiting periods

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Abstract

The distress associated with uncertainty differs in important ways from distress over clear and present stressors. Emotion regulation (ER) tendencies—namely reappraisal and suppression—have received considerable empirical attention, but the stressful uncertainty of waiting for important news poses unique ER challenges. Two longitudinal studies examined the role of these dispositional ER tendencies in predicting well-being (e.g., emotions, worry, subjective health, expectation management efforts) during uncertain waiting periods. Study 1 surveyed undergraduate students awaiting their grade on a midterm exam ($N = 137$; a 5-day wait); Study 2 surveyed law graduates awaiting their result on the California bar exam ($N = 230$; a 4-month wait). Consistently with past research, reappraisal was generally associated with positive markers of well-being. However, suppression was largely unassociated with well-being, in contrast with previous evidence. Our findings confirm the unique context of uncertain waiting periods and suggest that suppression may not be as detrimental during these periods as in other stressful situations.

Keywords Emotion regulation · Waiting · Uncertainty · Well-being · Reappraisal · Suppression

Introduction

Whether waiting for medical news, exam results, or water to boil, waiting is a part of daily life—but when the news one awaits is life-changing, waiting is often laden with worry. Emotion regulation (ER) strategies may mitigate this worry, but it is less clear which dispositional ER tendencies are most effective during stressful waiting periods ranging in duration from a few days to several months. Research on the ER tendencies toward cognitive reappraisal and expressive suppression has painted a fairly clear picture thus far: Reappraisal is largely adaptive, and expressive suppression is largely maladaptive (Gross 1998, 2002; John and Gross 2004; cf. Bonanno and Burton 2013; Soto et al. 2011). The goal of the current investigation is to extend this work to the stressful experience of awaiting uncertain news, testing the possibility that ER tendencies may function differently in this context. In two studies, we evaluate associations between ER tendencies—namely tendencies to use cognitive

reappraisal or expressive suppression—and well-being. We also explore links between ER tendencies and efforts to manage one's expectations about the future.

Uncertain waiting periods

Waiting is a common, stressful experience that benefits from the use of effective emotion regulation (see Sweeny 2018). Many ER and coping efforts fall short during these periods of acute uncertainty because such strategies are best-suited to address known stressors rather than an unknown future (Sweeny et al. 2016). Uncertain waiting periods are uniquely stressful because they combine uncertainty about and lack of control over one's future (Sweeny 2018). For example, undergraduate students awaiting the results of a midterm have little control over their outcome once the exam is over (Sweeny and Krizan 2013). Thus, the waiting period before learning one's outcome combines the stressful experiences of uncertainty and low control in a way that other difficult life events (e.g., studying for a difficult exam, receiving a bad grade) do not. Some are better equipped to handle this uncertainty than others (Sweeny and Andrews 2014), leaving open the possibility that individual differences in ER tendencies influence uncertain waiting experiences.

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The emotional experience of waiting is most difficult at the beginning and end of a waiting period (Howell and Sweeny 2016; Sweeny et al. 2016). During temporally-bounded waiting periods (i.e., waiting that begins and ends at a set time), worry and ER efforts typically follow a quadratic pattern, highest at the start of the wait and immediately before the receipt of news (Sweeny and Andrews 2014; Sweeny et al. 2016). The patterns of worry and ER efforts are linked, such that as worry reaches its peak, ER efforts rise to meet that need (Sweeny et al. 2016). Given that the psychological experience of waiting changes over the course of a waiting period, it may be that some ER tendencies are particularly beneficial at different points during the wait. This aim is exploratory given limited evidence on the effectiveness of reappraisal and suppression tendencies across time during a single stressful event. However, evidence supporting the effectiveness of avoidance coping in short-term responses to stressful events (Sheppes et al. 2011), when such strategies are typically harmful in the long-run, suggests some temporal patterns in ER effectiveness.

Emotion regulation tendencies

Deficits in ER are associated with worry and stress (Salters-Pedneault et al. 2006), which are commonly experienced while waiting (Sweeny and Andrews 2014; Sweeny and Falkenstein 2015). Researchers have identified cognitive reappraisal and expressive suppression as commonly used ER strategies (Gross and John 2003). We focus on these two trait-like, well-studied ER strategies in the current investigation.

ER strategies vary in their temporal deployment. Cognitive reappraisal, an antecedent-focused strategy, changes the way emotions are generated, curtailing one's reaction to emotional events before they become too upsetting. Expressive suppression, a response-focused strategy, changes the way that emotions are regulated after they are generated (Gross 2001). Over long waiting periods, this temporal variability in ER strategy deployment may have implications for the relative benefits of these strategies at different points. During particularly distressing periods of worry, curtailing emotion generation using the relatively active strategy of cognitive reappraisal may prove insufficient compared to ER strategies that altogether avoid engagement with the distressing thoughts and feelings (e.g., Sheppes et al. 2011). Investigations into suppression suggest that it may be effective, at least temporarily, in these moments (Bonanno and Burton 2013).

Current Investigation

In two longitudinal studies, we examined the role of ER tendencies in waiting experiences. Study 1 examined the experiences of undergraduate students awaiting their grade on a midterm exam (5-day wait), and Study 2 examined the experiences of law graduates awaiting their result on the bar exam (4-month wait). These studies addressed ecologically-valid waiting periods of differing lengths and of presumably differing importance, albeit in similar domains (academic/professional exams). The longitudinal nature of these studies permitted an exploration of waiting periods as they dynamically unfold over a set period of time and the ways that individuals' trait-like ER tendencies may play a differential role at different points during each waiting period.

Our investigation had two broad aims. First, we sought to evaluate overall associations between the two dispositional ER tendencies and experiences while awaiting uncertain news, including emotional state, self-reported sleep, subjective health, and expectation management efforts (bracing and hope/optimism). We hypothesized that people with a tendency to engage in cognitive reappraisal would report better health and well-being as they waited, and people with tendencies toward expressive suppression would report poorer health and well-being. The studies were not designed specifically for the current investigation, and thus we rely here on the array of well-being measures available within the datasets. We opted to use an inclusive strategy (i.e., including all available well-being measures in our analyses) rather than a limited strategy that targeted specific well-being outcomes, with the goal of observing patterns of associations rather than relying on single statistical tests.

Second, we sought to explore these associations across time. That is, might ER tendencies be more (or less) associated with health and well-being at particularly difficult (or easy) points in the waiting period? This aim was exploratory; therefore, we report no a priori hypotheses. Our examination of expectation management strategies was also exploratory, although past research on waiting experiences generally suggests that people engage in bracing for the worst (i.e., embracing a pessimistic outlook) when they are particularly distressed and embrace hope and optimism when they are feeling relatively positive.

Study 1

Participants

Undergraduate psychology students ($N = 288$, note rates of survey completion below; 68% women; $M_{Age} = 20.5$ years, $SD_{Age} = 2.67$ years; 17% White, 40% Asian or Pacific Islander, 36% Latinx, 2% Black or African-American, 5% other or multiple) were recruited for a study in a psychology course. Each student in the course was invited to join the study, and participants received extra credit in the course

for participating. The sample size was constrained by the number of students taking the course.

Procedure

Participants completed the first survey approximately two weeks prior to their midterm exam ($M = 10$ days pre-exam, range 0–14 days). After taking their exam, the students waited five days for the instructor to post exam grades online. During this waiting period, participants completed four surveys, approximately once per day.[1] The final waiting period survey was completed within 24 h prior to seeing their grade online, and participants completed one more survey after learning their grade. For the purposes of this study, we focus on the initial survey and four waiting surveys only. Of the 288 participants who completed the baseline survey, only 48% completed the first waiting survey (which was sent on a Friday evening), 69% completed the second waiting survey, 76% completed the third waiting survey, and 82% completed the final waiting survey. Full study materials, deidentified data, and bivariate correlations among variables are available on the Open Science Framework (https://osf.io/fuh5t/).

Measures

Emotion regulation

Emotion regulation questionnaire (ERQ)

The ERQ (Gross and John 2003) is a 10-item measure that uses a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*) to assesses the degree to which people typically use expressive suppression and cognitive reappraisal as emotion regulation strategies. Four items address expressive suppression (e.g., "When I am feeling negative emotions, I make sure not to express them"; "I keep my emotions to myself"; $M = 4.17$, $SD = 1.25$; $\alpha = 0.72$), and six items address cognitive reappraisal ("When I want to feel less negative emotion, I change the way I'm thinking about the situation"; "When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about"; $M = 5.08$, $SD = 1.09$, $\alpha = 0.86$). Higher scores indicate greater tendencies toward suppression and reappraisal, respectively.

Well-being

The following measures were assessed in each waiting survey.

Worry

Worry about the midterm exam was measured using three items, focusing on the past 24 h (i.e., the period between measurement points). One item assessed perseverative thought ("I can't seem to stop thinking about my Psych 1 midterm"; 1 = *strongly disagree*, 5 = *strongly agree*) and two items assessed anxiety ("I feel anxious every time I think about the Psych 1 midterm I took on [day]"; "I am worried about my grade on the Psych 1 midterm exam I took on [day]"; 1 = *not at all*, 5 = *extremely*). These items were averaged to create a composite that captured both the cognitive and affective aspects of worry (see Sweeny and Dooley 2017; $M = 2.56$, $SD = 0.80$, average $\alpha = 0.81$).

State anxiety and calm

Participants rated their anxiety and sense of calm about the midterm exam in the past 24 h with five and three items, respectively ("In the past 3 days I have felt [anxious, worried, nervous, distressed, scared] [calm, relaxed, at ease]"; 1 = *not at all*, 5 = *extremely*; anxiety: $M = 2.28$, $SD = 0.80$; average $\alpha = 0.90$; calm: $M = 1.95$, $SD = 0.78$; average $\alpha = 0.89$).

Positive and negative emotions

Using items adapted from the Positive and Negative Affect Schedule (Watson and Clark 1999), participants indicated the extent to which they experienced six positive emotions (e.g., grateful, happy, content; $M = 3.10$, $SD = 0.76$, average $\alpha = 0.87$) and nine negative emotions (e.g., ashamed, upset, afraid; $M = 1.61$, $SD = 0.67$, average $\alpha = 0.93$) in the past 24 h (1 = *very slightly or not at all*, 5 = *extremely*).

Sleep quality

Sleep quality the previous night was measured with five items from the Pittsburgh Sleep Quality Index (Buysse et al. 1989; e.g., "Last night, to what extent did you have trouble sleeping because you…could not get to sleep within 30 min?" "…woke up in the middle of the night or early morning?" 1 = *not at all*, 4 = *very much*; and "Last night, how would you rate the quality of your sleep overall?" 1 = *very good*, 4 = *very bad*). These items were selected with the goal of identifying sleep disruption due to psychological distress. Given the variable scaling, we first standardized

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[1] Due to the timeline of this waiting period, survey order and day of week were perfectly confounded (i.e., first survey on a Friday, second on a Saturday, etc.). Thus, we cannot account for potential day-of-week effects in this study.

Table 1 Key results from multilevel models

	Study 1		Study 2	
	Cognitive reappraisal	Expressive suppression	Cognitive reappraisal	Expressive suppression
	β [95% CI]	β [95% CI]	β [95% CI]	β [95% CI]
Worry				
ER main effect	0.11[+] [−0.008, 0.22]	0.09 [−0.03, 0.20]	0.02 [−0.09, 0.12]	−0.05 [−0.15, 0.05]
ER × linear time	0.02 [−0.03, 0.08]	0.003 [−0.05, 0.06]	0.008 [−0.03, 0.05]	−0.007 [−0.04, 0.03]
ER × quadratic time	0.01 [−0.03, 0.05]	0.03 [−0.01, 0.07]	−0.01 [−0.05, 0.01]	0.002 [−0.03, 0.03]
Reapp. × Suppress	−0.01 [−0.11, 0.09]		0.09[+] [−0.01, 0.19]	
State anxiety				
ER main effect	−0.06 [−0.16, 0.05]	0.13[*] [0.03, 0.24]	−0.005 [−0.10, 0.09]	−0.04 [−0.13, 0.05]
ER × linear time	0.03 [−0.04, 0.09]	0.02 [−0.04, 0.08]	−0.02 [−0.05, 0.02]	0.008 [−0.03, 0.05]
ER × quadratic time	0.009 [−0.04, 0.06]	0.01 [−0.05, 0.06]	−0.0005 [−0.04, 0.04]	−0.04[*] [−0.08, −0.001]
Reapp. × Suppress	0.04 [−0.05, 0.14]		0.06 [−0.03 0.15]	
State calm				
ER main effect	0.07 [−0.03, 0.17]	−0.17[**] [−0.27, −0.06]	0.13[**] [0.04, 0.22]	−0.02 [−0.11, 0.07]
ER × linear time	−0.07[*] [−0.12, −0.008]	0.006 [−0.05, 0.06]	0.007 [−0.04, 0.05]	−0.04[+] [−0.08, 0.006]
ER × quadratic time	−0.006 [−0.06, 0.05]	−0.05[+] [−0.10, 0.004]	0.004 [−0.04, 0.05]	0.03 [−0.02, 0.07]
Reapp. × suppress	0.08[+] [−0.01, 0.17]		−0.08[+] [−0.17, 0.001]	
Negative emotion				
ER main effect	−0.17[**] [−0.28, −0.06]	0.19[**] [0.08, 0.30]	−0.06 [−0.16, 0.05]	0.02 [−0.08, 0.13]
ER × linear time	−0.0003 [−0.05, 0.05]	−0.02 [−0.07, 0.03]	0.008 [−0.03, 0.05]	0.009 [−0.03, 0.05]
ER × quadratic time	−0.03 [−0.08, 0.03]	0.003 [−0.05, 0.05]	−0.01 [−0.05, 0.03]	−0.05[*] [−0.09, −0.002]
Reapp. × Suppress	−0.002 [−0.10, 0.10]		0.04 [−0.06, 0.14]	
Positive emotion				
ER main effect	0.23[**] [0.13, 0.33]	−0.21[**] [−0.31, −0.11]	0.25[**] [0.15, 0.34]	−0.06 [−0.16, 0.03]
ER × linear time	−0.07[*] [−0.11, −0.01]	0.02 [−0.03, 0.07]	0.01 [−0.03, 0.06]	−0.02 [−0.07, 0.02]
ER × quadratic time	−0.01 [−0.06, 0.03]	−0.02 [−0.07, 0.03]	−0.01 [−0.05, 0.03]	0.01 [−0.03, 0.06]
Reapp. × Suppress	0.08[+] [−0.01, 0.17]		−0.07 [−0.16, 0.02]	
Poor sleep				
ER main effect	−0.08 [−0.18, 0.03]	0.11[*] [0.007, 0.22]	−0.04 [−0.15, 0.07]	0.02 [−0.09, 0.14]
ER × linear time	0.01 [−0.02, 0.04]	−0.0007 [−0.03, 0.03]	0.004 [−0.04, 0.04]	−0.02 [−0.06, 0.02]
ER × quadratic time	−0.003 [−0.03, 0.03]	0.02 [−0.01, 0.05]	0.05[*] [0.006, 0.09]	−0.05[**] [−0.09, −0.01]
Reapp. × Suppress	−0.09[+] [−0.19, 0.003]		0.01 [−0.10, 0.12]	
Poor health				
ER main effect	–	–	−0.09[+] [−0.19, 0.005]	0.05 [−0.05, 0.15]
ER × linear time	–	–	0.02 [−0.02, 0.06]	0.03 [−0.02, 0.07]
ER × quadratic time	–	–	0.007 [−0.03, 0.05]	−0.05[*] [−0.09, −0.01]
Reapp.*Suppress			0.003 [−0.09, 0.10]	
Bracing				
ER main effect	0.001 [−0.11, 0.12]	0.14[*] [0.03, 0.26]	−0.04 [−0.16, 0.08]	−0.02 [−0.10, 0.14]
ER × linear time	0.02 [−0.03, 0.06]	−0.003 [−0.05, 0.04]	−0.03[+] [−0.06, 0.002]	−0.01 [−0.05, 0.02]
ER × quadratic time	0.003 [−0.03, 0.04]	0.02 [−0.02, 0.06]	0.03[+] [−0.001, 0.05]	0.03[+] [−0.002, 0.05]
Reapp. × Suppress	−0.04 [−0.14, 0.06]		0.02 [−0.10, 0.13]	
Hope/optimism				
ER main effect	0.21[**] [0.10, 0.32]	−0.23[**] [−0.33, −0.12]	0.14[**] [0.04, 0.25]	−0.06 [−0.17, 0.04]
ER × linear time	0.004 [−0.04, 0.05]	−0.007 [−0.05, 0.04]	−0.005 [−0.04, 0.03]	−0.01 [−0.05, 0.03]
ER × quadratic time	−0.02 [−0.07, 0.02]	0.02 [−0.03, 0.06]	0.002 [−0.04, 0.04]	0.02 [−0.02, 0.06]
Reapp. × Suppress	0.04 [−0.06, 0.14]		−0.09[+] [−0.19, 0.02]	

[**]$p < 0.01$; [*]$p < 0.05$; [+]$p < 0.10$

scores on each item and then averaged them into a composite ($M = -0.52$, $SD = 0.55$; average $\alpha = 0.67$).

Expectation management

Bracing

Two items measured the extent to which participants were bracing for the possibility of failure ("I'm bracing for the worst when it comes to my Psych 1 midterm grade"; "I want to make sure I keep my expectations low when it comes to my Psych 1 midterm grade"; 1 = *strongly disagree*, 5 = *strongly agree*; $M = 2.79$, $SD = 1.06$, average $r = 0.47$).

Positive expectation management

Two items measured the extent to which participants attempted to remain positive about their outcome on the midterm ("I'm hoping for the best when it comes to my Psych 1 midterm grade"; "I'm trying to be optimistic about my Psych 1 midterm grade"; 1 = *strongly disagree*, 5 = *strongly agree*; $M = 3.97$, $SD = 0.66$, average $r = 0.47$).

Results

We examined the role of emotion regulation (ER) tendencies (cognitive reappraisal and expressive suppression) using multilevel models in SAS 9.4 PROC MIXED that accounted for the longitudinal nature of our data. For each outcome measure, we ran a model predicting that well-being or expectation management variable from both of the ER tendencies (each grand-mean centered), linear and quadratic time (centered at the midpoint between the second and third measurement points, and then squared in the case of quadratic time), interactions between each ER tendency and each time variable, and the interaction between ER tendencies. We included both linear and quadratic time as predictors in our models because previous work has established a typical quadratic trend in many waiting experiences (see Sweeny and Andrews 2014; Sweeny et al. 2016). That is, waiting periods seem to be inherently "U-shaped" in terms of distress, such that people feel the worst at the start and end of the wait when uncertainty tends to be most salient. Some models failed to converge with time included as a random effect (for state calm and positive emotion), and thus we removed linear and quadratic random effects from those models.

Table 1 presents key model results. Below, we focus only on results that are significant at $p < 0.05$, given the relatively large number of statistical tests we present here. The tables indicate effects at $p < 0.10$.

Cognitive reappraisal

Regarding well-being, participants who were higher in reappraisal tendencies reported more positive emotion and less negative emotion. Turning to expectation management, participants who were higher in reappraisal tendencies reported more effort to remain hopeful and optimistic. Reappraisal tendencies also significantly interacted with the linear time trends of state calm and positive emotion. Figure 1 depicts the time trends for these variables at ± 1 SD (Panels 1 and 2; effects at ± 1 SD presented in Table 2). The simple effects in Table 2 reveal that participants high in reappraisal showed a significant negative linear trend, whereas participants low in reappraisal showed either a weaker trend (positive emotion) or a near-zero linear trend (state calm).

Expressive suppression

Regarding well-being, participants who were higher in suppression tendencies reported more state anxiety, less state calm, more negative emotion, less positive emotion, and poorer sleep. Turning to expectation management, participants who were higher in suppression tendencies reported greater effort to brace for the worst and less effort to remain hopeful and optimistic. Suppression tendencies did not significantly interact with time trends in any variable.

Reappraisal and suppression tendencies did not interact to predict any variable.

Study 2

Study 1 provided initial evidence for the protective quality of reappraisal tendencies and the potentially detrimental quality of suppression tendencies during the wait for moderately important news. The effects of ER tendencies were most consistent for general emotional states (positive and negative) and for efforts to embrace hope and optimism (positive for reappraisal, negative for suppression). Interestingly, neither ER tendencies was associated with worry, arguably the most central aspect of negative experiences during stressful waiting periods. Study 2 used a similar design to Study 1 to test our hypotheses in law graduates waiting for their result on the bar exam. Thus, the goal of Study 2 was to replicate and extend our findings with a more stressful exam with greater potential for significant consequences.
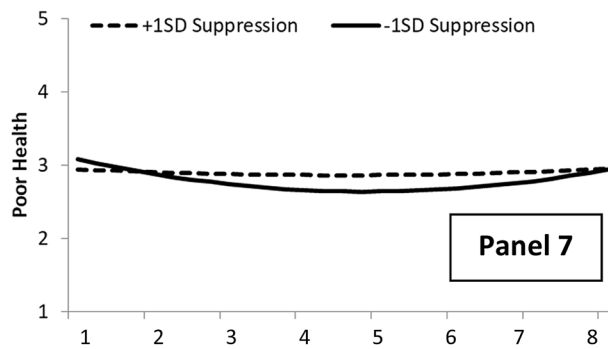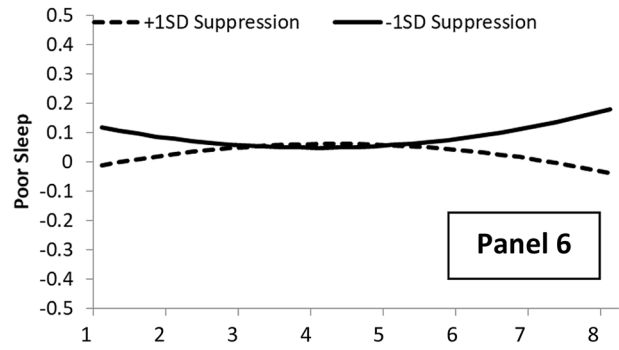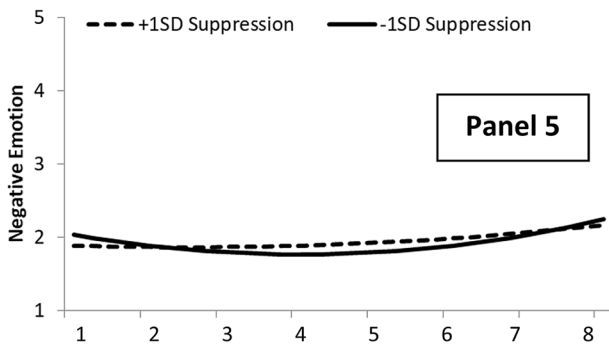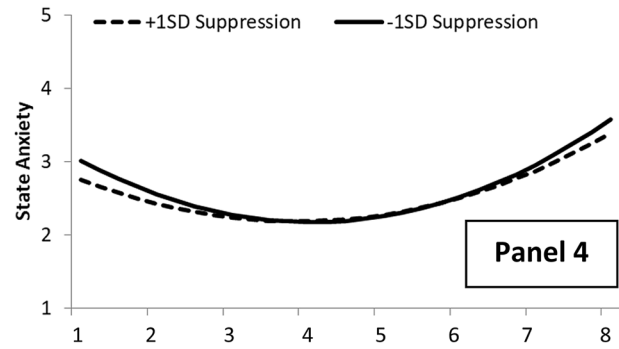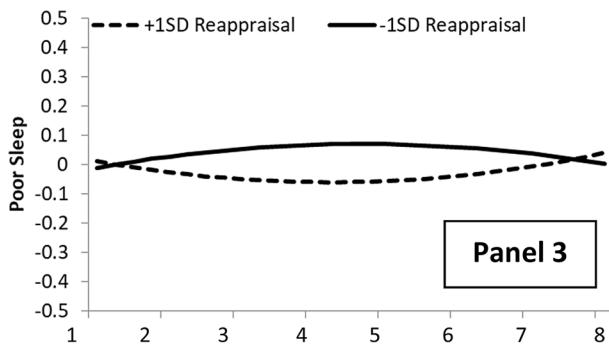
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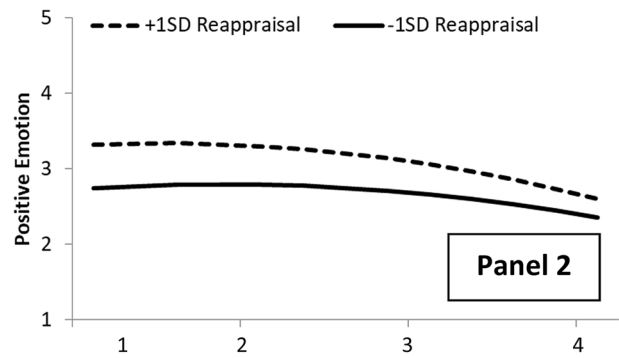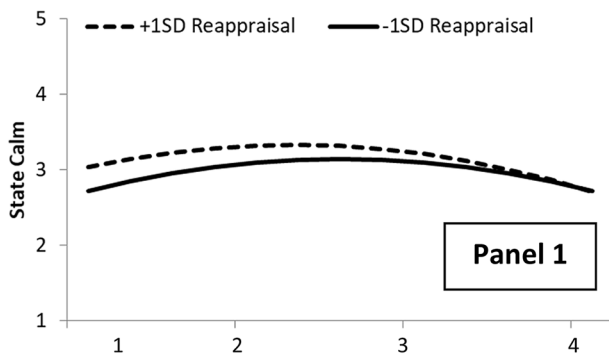
STUDY 2

Fig. 1 Interactions between emotion regulation and time trends in waiting experiences

Table 2 Interactions with time trends, decomposed at ± 1 SD

			+1 SD on ER Tendency $b\ [CI_{95\%}]$	−1 SD on ER Tendency $b\ [CI_{95\%}]$
Study 1				
Reappraisal	State calm	Linear time	−0.11** [−0.19, −0.03]	0.002 [−0.08, 0.08]
		Quadratic time	−0.20** [−0.28, −0.13]	−0.19** [−0.26, −0.12]
Reappraisal	Positive emotion	Linear time	−0.24** [−0.30, −0.17]	−0.14** [−0.21, −0.08]
		Quadratic time	−0.11** [−0.17, −0.06]	−0.08** [−0.14, −0.03]
Study 2				
Reappraisal	Poor sleep	Linear time	0.004 [−0.01, 0.02]	0.002 [−0.02, 0.02]
		Quadratic time	0.007+ [−0.0006, 0.01]	−0.006 [−0.01, 0.001]
Suppression	State anxiety	Linear time	0.09** [0.06, 0.12]	0.08** [0.06, 0.11]
		Quadratic time	0.07** [0.06, 0.09]	0.09** [0.08, 0.11]
Suppression	Negative emotion	Linear time	0.04** [0.02, 0.06]	0.03** [0.01, 0.05]
		Quadratic time	0.01* [0.002, 0.02]	0.03** [0.02, 0.04]
Suppression	Poor sleep	Linear time	−0.004 [−0.02, 0.01]	0.009 [−0.007, 0.03]
		Quadratic time	−0.007+ [−0.01, 0.0005]	0.008* [−0.0004, 0.02]
Suppression	Poor health	Linear time	0.001 [−0.03, 0.03]	−0.02 [−0.05, 0.005]
		Quadratic time	0.007* [−0.006, 0.02]	0.03** [0.02, 0.04]

**p < 0.01; *p < 0.05; +p < 0.10

Participants

Law graduates ($N = 230$; 61% women; $M_{Age} = 27.6$; 67% White, 25% Asian or Pacific Islander, 7% Latinx, 1% Black or African-American) took part in a longitudinal study regarding their experience with the California bar exam. The graduates were recruited through student bar associations, alumni offices, and relevant listservs. Participants received $10 in Amazon gift cards for each survey they completed. The sample size reflects the number of law graduates we were able to recruit before the bar exam in July 2013.

Procedure

Participants completed the first survey while they were preparing to take the bar exam, approximately 2 weeks prior to the start of the exam ($M = 14$ days pre-exam, range 0–16 days). After taking the exam, participants completed a total of eight surveys, once every two weeks over the four-month waiting period. Participants completed the final survey after their results were posted online and they knew whether they had passed or failed. For the purposes of this study, we focus on the initial survey and eight waiting surveys only. Of the 230 participants who completed the baseline survey, the completion rate for the waiting surveys was quite high (> 90% for all surveys). Full study materials and bivariate correlations among variables are available on the Open Science Framework (https://osf.io/d35ap/).

Measures

Participants completed the same measures as in Study 1, with updated wording in some cases to reflect the context of the bar exam. As in Study 1, participants in Study 2 completed measures of emotion regulation in an initial survey using the ERQ (reappraisal: $M = 4.79$, $SD = 1.13$, $\alpha = 0.85$; suppression: $M = 3.50$, $SD = 1.30$, $\alpha = 0.76$). The well-being measures in this study included worry (past 3 days; $M = 2.79$, $SD = 0.81$, average $\alpha = 0.87$), state anxiety (past 3 days; $M = 2.66$, $SD = 0.75$, average $\alpha = 0.89$), state calm (past 3 days; $M = 2.00$, $SD = 0.64$, average $\alpha = 0.91$), positive emotions (past few days; $M = 2.91$, $SD = 0.63$, average $\alpha = 0.87$), negative emotions (past few days; $M = 1.96$, $SD = 0.66$, average $\alpha = 0.92$), and sleep disruption (past week; standardized as in Study 1; $M = 0.01$, $SD = 0.53$, average $\alpha = 0.80$). An additional item was added in Study 2 to measure subjective health (past week, from the SF-36; Ware and Sherbourne 1992; $M = 2.86$, $SD = 0.76$). As in Study 1, this study included measures of bracing ($M = 3.37$, $SD = 1.00$, average $r = 0.66$) and positive expectation management ($M = 4.11$, $SD = 0.58$, average $r = 0.51$).

Results

As in Study 1, we examined the role of ER tendencies using multilevel models in SAS 9.4 PROC MIXED that accounted for the longitudinal nature of our data. We once again included both linear and quadratic time as predictors in our models (all models converged including linear and quadratic time as random effects). Time was centered between the fourth and fifth measurement points and then squared to create the quadratic term. Table 1 presents key model results.

Cognitive reappraisal

Regarding well-being, participants who were higher in reappraisal tendencies reported greater state calm and positive emotion. Reappraisal tendencies also interacted with the quadratic time trend for sleep. Figure 1 depicts the time trend for poor sleep at ± 1 SD (Panel 3; effects at ± 1 SD presented in Table 2). The simple effects in Table 2 reveal that participants low in reappraisal showed a weak (non-significant) negative quadratic trend, whereas participants high in reappraisal showed a weak (marginal) positive quadratic trend. Turning to expectation management, participants who were higher in reappraisal tendencies reported more effort to remain hopeful and optimistic. Reappraisal tendencies did not significantly interact with time trends in either expectation management strategy.

Expressive suppression

Suppression did not predict any well-being measure. However, suppression tendencies significantly interacted with the quadratic time trends of state anxiety, negative emotion, poor sleep, and poor health. Figure 1 depicts the time trends for these variables at ± 1 SD (Panel 4–7; effects at ± 1 SD presented in Table 2). For state anxiety, negative emotion, and poor health, the simple effects in Table 2 reveal that participants low in suppression showed strong positive quadratic trends, whereas participants high in suppression showed somewhat weaker positive trends. For poor sleep, participants low in suppression showed a significant positive quadratic trend, whereas participants high in suppression showed a relatively weak negative trend. Suppression tendencies did not predict average levels of either expectation management strategy, nor did suppression interact with their time trends.

As in Study 1, reappraisal and suppression tendencies did not interact to significantly predict any variable.

Discussion

The goal of our endeavor was to examine the role of trait-like emotion regulation (ER) tendencies (cognitive reappraisal and expressive suppression) during two real-life academic and professional waiting periods. Although the findings were not entirely consistent across well-being measures and across studies, some patterns emerged. Overall, the links between ER tendencies and well-being were more nuanced than is typical in studies of these tendencies in daily life or during stressors that lack the acute uncertainty of waiting periods, confirming the value of our investigation over and above previous findings.

One notable consistency across studies is that neither ER tendencies significantly predicted worry during either waiting period, and neither ER tendency predicted a reduction in bracing for the worst (suppression tendencies predicted increased bracing in Study 1). Worry and bracing are central to the distressing nature of waiting periods (e.g., Sweeny 2018; Sweeny et al. 2006), so it may be that even the most dispositionally healthy emotion-regulator cannot withstand the situational press of acute uncertainty. Other findings are notable for their inconsistency across studies. First, suppression tendencies were unrelated to average levels of well-being in the longer, more consequential waiting period in Study 2 (with small average effect sizes, ≤|.06|), in contrast to their more consistent effects in the shorter, relatively mild waiting period in Study 1 (effect sizes ranging from |.09| to |.23|). In most studies, suppression is linked to poor well-being and other negative life outcomes (e.g., Moore et al. 2008; Giese-Davis et al. 2008). Although suppression is a maladaptive ER strategy in many circumstances, some otherwise maladaptive strategies have their time and place (Bonanno and Burton 2013; Bonanno et al. 2004; Hollenstein et al. 2013). It may be that lengthy and/or highly consequential waiting periods present circumstances in which expressive suppression may not be particularly harmful (or helpful).

On the other hand, suppression tendencies only interacted with the time trends of well-being in Study 2′s longer waiting period (albeit with small effect sizes, ≤|.05|)—perhaps unsurprisingly, given that an experience that unfolds over months rather than days provides greater opportunity for temporal effects. Across three measures of poor well-being (state anxiety, negative emotion, and poor health), people who were higher in suppression tendencies showed a flatter curve in their negative experiences, suggesting that they got a bit less of the relief that tends to arrive during the middle of lengthy waiting periods (Sweeny and Andrews 2014). These differences were quite small, as is clear in Panels 4, 5, and 7 of Fig. 1; however, they may be a good target for future research and potentially future interventions to bolster

well-being among those at risk during different parts of a stressful waiting period. The small effect sizes may limit the potential impact of such interventions; on the other hand, even small effects can have a big impact when scaled to the population level (e.g., aspirin's protective effect against heart attacks; see Rosnow and Rosenthal 2003 for a discussion of this phenomenon).

Our findings for cognitive reappraisal were generally consistent with previous research establishing the benefits of reappraisal. However, with one exception we found these benefits only for positive markers of well-being and coping (i.e., state calm, positive emotion, positive expectation management; effect sizes ranging from 0.07 to 0.23, average = 0.17) and not for negative markers (effect sizes ranging from −0.17 to 0.11, average = −0.04). As noted above, waiting for uncertain news is almost inevitably worrisome due to the treacherous combination of uncertainty and a lack of control, and as such that worry cannot be immediately resolved in the types of waiting periods studied here. Thus, reappraisal may fall short when it comes to reducing worry and its associated negative emotions until resolution occurs (e.g., learning one's grade) and one can reappraise the outcome. However, it seems to have some power to boost positive emotions during an otherwise stressful period. That is, perhaps the face of reappraisal during stressful waiting periods is not "there is nothing to worry about," but rather "this is not all bad, and things may be okay."

Reappraisal also interacted with some time trends for well-being, most notably with state calm and positive emotions in Study 1, despite the short waiting period. In these cases, reappraisal interacted with the linear trend (with small effect sizes, both −0.07), which represents the "tilt" of the curve, in such a way that people high in reappraisal tendencies were better off at the beginning of the waiting period but less so at the moment of truth. Other research has revealed that the moment of truth is a powerful situational force that seems to distress even the most optimistic, up-beat people (Sweeny and Falkenstein 2015), and our findings here provide further evidence to that point.

Finally, both reappraisal and suppression interacted with the time trend for poor sleep in Study 2 (again with small effects, both |0.05|), and in similar ways: People with more generally-beneficial ER tendencies (high reappraisal, low suppression) showed improved sleep quality during the middle of the wait, whereas people with more generally-detrimental ER tendencies (low reappraisal, high suppression) showed relatively poor sleep quality during the middle of the wait. This finding is both novel and unexpected, so further research should attempt to replicate it in different contexts and with objective indicators of sleep quality.

Limitations and conclusions

Our findings provide an initial test of the role of ER tendencies in the uniquely stressful context of uncertain waiting periods. Some of our findings are consistent with studies of these tendencies in other contexts, but our studies reveal intriguing nuances in these associations. Our studies had several strengths, most notably the use of real-world waiting periods with real consequences, our use of validated ER measures, and our ability to examine an array of well-being markers rather than relying on single indicators. Our findings also support the notion that it is insufficient to study ER tendencies without considering contextual factors (in this case, the type of stressor people are facing; Gratz and Roemer 2004).

However, our studies were also limited in several key ways. First, the correlational nature of our methods render causal conclusions premature. Given the relatively stable nature of the ER tendencies we studied, we suspect that reverse causality (e.g., poor well-being leads to less reappraisal) is unlikely, but third-variable explanations remain plausible. Second, we focused on two well-established ER tendencies in this study, but these tendencies are not the only ones that may be important to consider. Future studies can expand this line of inquiry to examine traits and tendencies such as distraction and emotional (rather than expressive) suppression that may promote well-being during waiting periods. For example, as our findings speak to people's tendencies to actively engage in reappraisal or suppression, future studies could investigate deficits or difficulties with emotion regulation, such as an inability to accept emotions or beliefs in the ineffectiveness of ER strategies (Gratz and Roemer 2004).

In addition, given the dynamic nature of waiting periods, investigating the flexible use of multiple strategies is a logical next step. Future studies should examine ER processes during waiting periods rather than the trait approach we took in our investigation. Finally, our investigation was limited to two available datasets that both investigated experiences awaiting feedback on exams, and thus we cannot be sure that our findings extend to other waiting contexts.

For now, our findings reveal clear individual differences in the effectiveness of emotion regulation during waiting periods and point to opportunities for intervention development to bolster cognitive reappraisal and diminish expressive suppression in ways that mitigate the familiar stress of waiting.

Compliance with Ethical Standards

Conflicts of interest The authors declare that they have no conflict of interest.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Ethics Approval Approval was obtained from the ethics committee of the authors' university. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

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