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Flexible, yet firm: A model of healthy emotion regulation

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Abstract

We propose a model of healthy intentional emotion regulation that includes (1) a large repertoire of (2) adaptive strategies that (3) one persists with despite initial negative feedback. One hundred forty-four undergraduates (average age = 19.20 years; 68% female, 79% Caucasian) completed a novel performance task indicating what they would think or do to feel better in response to eleven stressful vignettes. After their initial response, participants indicated four more times how they would respond if their previous strategy was not working. Raters categorized each response as an emotion regulation strategy and coded the adaptiveness of each strategy. Participants self-reported Neuroticism, Extraversion, Conscientiousness, Borderline Personality Disorder (BPD) symptoms, and depressive symptoms. We regressed each personality dimension and psychopathology symptom on our model of healthy emotion regulation. Neuroticism was negatively associated with adaptiveness and persistence. Extraversion was positively associated with adaptiveness. Conscientiousness was positively associated with repertoire, adaptiveness, and persistence, while BPD symptoms were negatively associated with all three variables. Depressive symptoms were negatively associated with persistence. These preliminary findings suggest that people with larger repertoires of more adaptive emotion regulation strategies who persist with these strategies despite initial negative feedback report less personality pathology and psychological distress.

Keywords

emotion regulation; depression; personality; persistence; flexibility

Emotion regulation, defined as the process of altering the onset, intensity, and/or duration of emotions (Gross & Thompson, 2007), can be accomplished in many ways. For instance, to reduce anxiety at a party, a person could start a conversation with someone new, drink alcohol to reduce her inhibitions, or leave. There is evidence that emotion regulation flexibility, defined as the tendency to match generally effective strategies to the appropriate emotional context, is beneficial for reducing negative emotions (e.g., Bonanno & Burton, 2013; Cheng, 2001). However, researchers have rarely provided empirical tests of how aspects of emotion regulation flexibility function together simultaneously (but see Southward & Cheavens, 2017, for an example) in relation to psychological health.

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We propose that the emotion regulation profile that characterizes psychological health is analogous to an expert craftsman and her toolbox. A useful toolbox includes a variety of tools (i.e., a large repertoire of emotion regulation strategies) of high quality (i.e., more adaptive than not). Once the craftsman selects a tool, she gives it time to work despite difficulties (i.e., persist in the use of strategies).

This profile complements current models of emotion regulation. It takes an individual differences perspective (Bonanno & Burton, 2013) by identifying patterns in how people tend to regulate emotions within and between situations. It also provides a common metric (i.e., adaptiveness) by which to compare strategies and which may have direct links to psychological health (Aldao, Nolen-Hoeksema, & Schweizer, 2010). This profile further explicitly compares switching and persisting with strategies in response to repeated negative feedback, a response pattern that may be particularly relevant for the development of psychopathology (Daskalakis, Bagot, Parker, Vinkers, & de Kloet, 2013). Finally, this profile can serve as a framework in which researchers can incorporate other aspects of emotion regulation (e.g., strategy-goal congruence, strategy-situation fit).

Emotion Regulation Repertoire

People with larger emotion regulation repertoires (i.e., the number of unique strategies one uses to change emotional responses) should have better psychological health because they have more regulatory resources (Cheng, Lau, & Chan, 2014). Larger emotion regulation repertoires have been associated with fewer symptoms of depression (Herman-Stahl, Stemmler, & Petersen, 1995), as well as lower momentary negative affect and greater momentary positive affect (Heij & Cheavens, 2014).

Smaller repertoires have been associated with higher levels of Borderline Personality Disorder (BPD) features. Emotion dysregulation is central to BPD (Linehan, 1993), making it an important construct to assess when determining healthy emotion regulation profiles. Across three samples, people with smaller emotion regulation repertoires reported more BPD features, over and above negative affect (Chapman, Leung, & Lynch, 2008; Glenn & Klonsky, 2009; Salsman & Linehan, 2012).

Adaptiveness: Context Dependent or Strategy-Specific?

The adaptiveness of emotion regulation strategies may depend on situational contexts (Webb, Miles, & Sheeran, 2012). Someone with healthy psychological functioning may choose strategies based on properties of specific situations (e.g., distraction in uncontrollable situations and problem-solving in controllable situations). Alternatively, emotion regulation strategies may be generally adaptive or maladaptive (Gross & John, 2003). Cognitive reappraisal and acceptance, for instance, are considered adaptive across most contexts, while strategies such as emotional suppression and rumination are often considered maladaptive (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Although people who tend to use many adaptive strategies and few maladaptive strategies report fewer symptoms of depression (Herman-Stahl et al., 1995), a balanced profile of putatively adaptive and maladaptive emotion regulation strategies has also been associated with greater adjustment, including

lower levels of anxiety and depression (Cheng et al., 2014). It is unclear from these conflicting findings whether relying on more adaptive strategies or a balanced use of putatively adaptive and maladaptive strategies is associated with greater psychological health.

Strategy Persistence

When working toward a valued goal, it is often adaptive to persist in the face of obstacles (Carver & Scheier, 2001). Because the goal of emotion regulation is to change emotions, it may be more adaptive to continue using a strategy, despite feedback that the emotion is not immediately changing, rather than quickly switching strategies.

Few researchers have directly investigated how switching strategies within situations is related to psychological functioning. Aldao and Nolen-Hoeksema (2013) had participants watch disgust-eliciting film clips and report their levels of disgust. After watching each clip, participants rated the extent to which they used six emotion regulation strategies during the clips. Participants who used multiple strategies reported greater disgust and they reported using their strategies to a lesser extent than those who used only a single strategy, suggesting that using fewer strategies to a greater extent may reduce disgust. Alternatively, greater disgust may have prompted participants to use more strategies.

There are often many options for changing emotions (e.g., Heij & Cheavens, 2014). Thus, switching strategies when given feedback that the current strategy is not working may be more adaptive. Greater frequency of switching from reappraisal to distraction was associated with greater life satisfaction among people more sensitive to internal physiological feedback but less life satisfaction among those less sensitive to internal feedback (Birk & Bonanno, 2016). Switching strategies may be related to adaptive outcomes if motivated by accurate internal feedback, but switching strategies without giving each strategy time to work may be associated with maladaptive outcomes.

Despite these mixed findings, researchers in several domains have reported beneficial effects of persistence. Perseverance of effort is strongly associated with academic performance (Credé, Tynan, & Harms, 2017), while deliberate, persistent practice accounts for significant variance in educational outcomes, sports performance, musical achievement, and skill at games (Macnamara, Hambrick, & Oswald, 2014). These findings provide converging evidence that persisting with strategies in response to difficulties may be part of a healthy emotion regulation profile.

Current Study

We tested the relative associations of repertoire size, strategy adaptiveness, and strategy persistence with personality dimensions and symptoms of psychopathology in response to hypothetical stressful scenarios and negative environmental feedback¹. We chose to assess personality dimensions and symptoms of psychopathology for several reasons. First, two

¹We examined environmental feedback rather than internal feedback in order to increase the internal validity of the design so that all participants were exposed to standardized feedback and to complement Birk and Bonanno's (2016) findings.

particular personality dimensions, Neuroticism and Extraversion, represent the tendency for people to experience negative emotions and positive emotions, respectively (Costa & McCrae, 1992). Because we were interested in how people regulate emotions at an individual difference level, these were particularly appropriate measures. Similarly, because symptoms of psychopathology, including depression and BPD, may be characterized as breakdowns in emotion regulation (Joormann & Gotlib, 2010; Linehan, 1993), we included these measures as well. Finally, we assessed Conscientiousness because it represents essential aspects of psychological health beyond emotional responding, including impulse control, goal-directedness, and the ability to plan (Costa & McCrae, 1992). We hypothesized that larger emotion regulation repertoires, more adaptive strategies, and greater strategy persistence would collectively be associated with lower Neuroticism, higher Extraversion and Conscientiousness, and fewer symptoms of BPD and depression.

Materials and Methods

Participants

Undergraduates at a large Midwestern university were recruited via an introductory psychology course. Participants ($N = 144$; $M_{\text{age}} = 19.20$, $SD = 1.23$; 68% female, 79% Caucasian) were awarded partial course credit. The sample size was determined by a power analysis, assuming $\alpha = .05$, power = .80, and small-to-medium multiple regression effect sizes. Participants under 18 years old were excluded. Of note, 43.8% of the sample ($n = 63$) scored at or above the recommended cutoff of 20 on the CES-D indicating mild to moderate depression symptoms (Vilagut, Forero, Barbaglia, & Alonso, 2016). Study procedures were IRB-approved, and all participants provided informed consent.

Materials

Emotion regulation—We created eleven vignettes describing stressors college students may face (Table 1)². These vignettes were created based on discussions among three study authors (M.W.S, E.M.A, J.S.C.) to elicit a breadth of negatively-valenced emotions (e.g., anxiety, anger, guilt, loneliness, sadness, surprise) in a variety of inter- and intra-personal scenarios involving stressors of relatively shorter and longer duration. After the scenarios were generated, we discussed them with undergraduate research assistants to get feedback on scenarios. The undergraduate research assistants agreed that the scenarios were reflective of stressors faced by undergraduate students. After reading each vignette, presented in a random order, participants provided a free response to the question, “What would you think or do first to feel better?” After responding to all vignettes, the vignettes were presented again, along with participants’ initial response. To assess persistence, participants were prompted, “If that strategy is not working, what would you think or do to feel better? (You may continue thinking or doing the same thing)” and were asked to provide a second free response. This prompt was repeated three more times for each vignette. Participants thus generated five responses to each vignette (i.e., 55 responses total per participant).

²Nelis, Quoidbach, Hansenne, and Mikolajczak (2011) showed that multiple choice responses to vignettes describing hypothetical stressful situations demonstrated good internal consistency as well as good convergent and discriminant validity with measures of emotion, emotion regulation, and personality among a relatively large ($N = 481$) sample of Belgian university students.

Four undergraduate raters (3 female, 1 male) trained by study authors (E.M.A. and M.W.S.) coded each response as one of 30 categories, based primarily on a previous study of a wide range of emotion regulation strategies (i.e., Heiy & Cheavens, 2014; Table 2). Ten categories not assessed by Heiy and Cheavens (2014) were generated by the study authors before coding but after reviewing a subset of participant responses to ensure adequate conceptual coverage (i.e., express emotions, information gathering, isolation, leave the situation, nothing - wait to feel better, prayer, reflection, relationship antagonism, relationship maintenance/repair, and therapy/counseling). Raters coded each participant's set of five responses in order, but sets were randomized by participant and vignette. Individual responses with agreement 50% or less ($n = 835$; 10.5%) were resolved by M.W.S. Raters also coded each response as adaptive (i.e., likely to be effective/helpful in general; scored 1) or maladaptive (i.e., unlikely to be effective/helpful in general; scored 0). To train raters to apply these definitions, we generated sample responses and raters coded these responses. These codings were reviewed and discussed by study authors with raters during weekly reliability meetings that continued throughout the coding process. Group consensus was achieved between study authors and coders for ratings of strategy category and strategy adaptiveness. To determine adaptiveness, coders were instructed to consider the content of the response and the context of the vignette, applying the definitions of adaptive and maladaptive strategies above. We averaged each rater's adaptiveness ratings across all responses for each participant.

We constructed three indices of emotion regulation. First, we calculated each participant's repertoire by counting the number of unique strategies used across all vignettes. Second, we calculated each participant's overall adaptiveness by averaging the adaptiveness ratings of all their responses. Finally, we calculated persistence by averaging the number of times each participant changed strategies *per vignette*. A strategy change was defined as any time a given strategy category differed from the category immediately preceding it within each set of five responses. The number of changes could range from zero (did not change at all) to four (changed every time). We averaged these ratings across all vignettes for each participant and multiplied this result by -1 to interpret it as persistence.

We evaluated the convergent validity of these indices of emotion regulation by comparing them to the Generalized Expectancy for Negative Mood Regulation Scale (NMR; Catanzaro & Mearns, 1990). The NMR provides participants with descriptions of potential responses to negative emotions; participants rate the degree to which each response is true for them, and higher scores indicate a greater belief in one's ability to alleviate negative moods. Similarly, we asked participants to describe how they would respond to stressful scenarios eliciting negative emotions. We regressed participants' NMR scores on our three indices of a healthy emotion regulation profile because we believe these three indices function collectively. As expected, repertoire, $\beta = .20$, $SE = .11$, $p = .07$, 95% CI [.00, .43], adaptiveness, $\beta = .35$, $SE = .09$, $p < .01$, 95% CI [.20, .54], and persistence, $\beta = .29$, $SE = .12$, $p = .02$, 95% CI [.06, .52] were all positively associated with NMR scores.

Symptoms of psychopathology and personality dimensions

Center for Epidemiologic Studies - Depression scale (CES-D; Radloff, 1977): The CES-D is a 20-item scale designed to assess symptoms of depression over the past week. Respondents indicate the frequency of each symptom, resulting in a total score. Internal consistency in the current sample was excellent ($\alpha = .91$).

Inventory of Interpersonal Problems – Borderline Personality Disorder scale (IIP-BPD; Lejuez, Daughters, Nowak, Lynch, Rosenthal, & Kosson, 2003): The IIP-BPD is an 18-item scale designed to assess BPD features in unselected samples. A total score is calculated by averaging the IIP-Aggression and IIP-Interpersonal Sensitivity subscales, which correlate stronger with BPD-relevant constructs than the IIP total score in college samples (Lejuez et al.). Internal consistency in the current sample was good ($\alpha = .88$).

NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992): The NEO-FFI is a 60-item scale designed to assess Big Five personality traits. The Neuroticism subscale measures the tendency to experience negative affect. The Extraversion subscale assesses the tendency to be sociable, active, and experience positive affect. The Conscientiousness subscale measures the tendency to be orderly, goal-driven, and dependable. Internal consistency in the current sample was good ($\alpha = .84-.86$).

Procedure

Participants completed all measures online. After responding to the vignettes, participants completed self-report measures in a random order.

Analytic Method

We modeled these data as multiple linear regressions to estimate the simultaneous associations of each aspect of emotion regulation, accounting for the others. We regressed personality and psychopathology variables on aspects of emotion regulation. Our main hypotheses regarding emotion regulation and personality dimensions concerned associations with Neuroticism, Extraversion, and Conscientiousness because these dimensions are most strongly associated with symptoms of clinical disorders (Kotov, Gamez, Schmidt, & Watson, 2010). Regression models should not be interpreted causally or as temporally sequenced because these data are cross-sectional.

As an exploratory analysis, we examined whether the associations between emotion regulation and personality and psychopathology varied as a function of each aspect of emotion regulation by testing all two- and three-way interactions among aspects of emotion regulation.

Results

Preliminary Analyses

We first examined the psychometric properties of our vignette ratings. When categorizing any given response as one of 30 strategies, raters demonstrated acceptable reliability (Krippendorff's $\alpha = .67$). When averaging raters' codings of adaptiveness across all of

each participant's responses, raters demonstrated excellent reliability (intraclass correlation coefficient = .92). Age was not significantly correlated with adaptiveness, $r = -.16$, $p = .05$, 95% CI $[-.39, .07]$, repertoire size, $r = .05$, $p = .54$, 95% CI $[-.10, .21]$, or strategy persistence, $r < .001$, $p = 1.00$, 95% CI $[-.14, .15]$. Similarly, there were no significant differences between Caucasian and minority participants on measures of adaptiveness, $t(38.54) = 1.93$, $p = .06$, 95% CI $[.00, .14]$, repertoire size, $t(142) = .81$, $p = .42$, 95% CI $[-.65, 1.54]$, or strategy persistence, $t(142) = -.77$, $p = .44$, 95% CI $[-.44, .20]$. Female participants ($M = .81$, $SD = .12$) reported significantly more adaptive strategies than male participants ($M = .74$, $SD = .18$), $t(67) = 2.49$, $p = .02$, 95% CI $[.01, .13]$. However, there were no differences in repertoire size, $t(142) = .44$, $p = .66$, 95% CI $[-.74, 1.17]$, or strategy persistence, $t(70.43) = -1.48$, $p = .14$, 95% CI $[-.54, -.08]$ between female and male participants.

We then examined correlations among our measures of interest (Table 3). Larger repertoires were associated with less persistence, $r = -.57$, $p < .01$, 95% CI $[-.66, -.44]$ but were unrelated to adaptiveness, $r = -.17$, $p = .04$, 95% CI $[-.37, .04]$, while adaptiveness and persistence were also unrelated, $r < .005$, $p = .97$, 95% CI $[-.17, .17]$. Repertoire size was not associated with personality or symptoms of psychopathology, $ps > .30$. Adaptiveness was negatively associated with IIP-BPD, $r = -.19$, $p = .02$, 95% CI $[-.35, -.01]$, and positively associated with Extraversion, $r = .34$, $p < .01$, 95% CI $[.19, .48]$, and Conscientiousness, $r = .29$, $p < .01$, 95% CI $[.08, .49]$. Persistence was negatively associated with IIP-BPD, $r = -.18$, $p = .03$, 95% CI $[-.35, -.02]$, and Neuroticism, $r = -.23$, $p < .01$, 95% CI $[-.39, -.06]$.

Primary Analyses

We then tested associations between emotion regulation, personality dimensions, and psychopathology symptoms with multiple linear regressions entering repertoire, adaptiveness, and persistence as simultaneous independent predictors of Neuroticism, Extraversion, Conscientiousness, BPD features, and symptoms of depression, respectively (Table 4). Variables were standardized ($M = 0$, $SD = 1$) to ease interpretation.

Neuroticism was negatively associated with adaptiveness and persistence. Extraversion was associated with adaptiveness only. Conscientiousness was positively associated with repertoire size, adaptiveness, and persistence, while BPD symptoms were negatively associated with all three emotion regulation indices. Depressive symptoms were only negatively associated with persistence³.

³When including age, gender, and ethnicity (dichotomized) as moderators of all associations, both age, $\beta = .32$, $SE = .10$, $p < .01$, 95% CI $[.12, .51]$ and ethnicity, $\beta = -.60$, $SE = .26$, $p = .02$, 95% CI $[-1.11, -.08]$ moderated the association between repertoire size and depressive symptoms. Repertoire size was negatively associated with depressive symptoms among participants under 18.29 years old, $\beta = -.30$, $SE = .12$, $p = .02$, 95% CI $[-.54, -.05]$, but positively associated with depressive symptoms among those older than 19.98 years, $\beta = .34$, $SE = .14$, $p = .02$, 95% CI $[.06, .61]$. Repertoire size was negatively associated with depressive symptoms among participants who identified as minorities, $\beta = -.66$, $SE = .23$, $p = .01$, 95% CI $[-1.12, -.20]$ but unrelated to depressive symptoms among participants who identified as Caucasian, $\beta = -.06$, $SE = .11$, $p = .58$, 95% CI $[-.29, .16]$. Gender moderated the association between adaptiveness and depressive symptoms, $\beta = .51$, $SE = .17$, $p < .01$, 95% CI $[.17, .84]$. Adaptiveness was negatively associated with depressive symptoms among women, $\beta = -.45$, $SE = .12$, $p < .01$, 95% CI $[-.68, -.21]$ but unrelated to CES-D scores among men, $\beta = .06$, $SE = .12$, $p = .61$, 95% CI $[-.18, .30]$. Because we did not have *a priori* hypotheses regarding these associations and because examining these associations produced 3 significant findings out of 45 tests, these results should be interpreted with extreme caution.

To test our exploratory hypothesis, we re-ran our models including all two- and three-way interactions. The product terms of all two-way, $ps > .25$, and three-way, $ps > .12$, interactions were not significant.

Discussion

We proposed that a psychologically healthy emotion regulation profile would balance flexibility and consistency of strategy use – specifically, better psychological functioning would be associated with larger repertoires of adaptive strategies used persistently. We use the metaphor of a craftsman with a well-equipped toolbox. Someone who responds well to the contingencies of her craft likely has a variety of tools (i.e., a large repertoire). These tools are in good working order (i.e., adaptive strategies). Additionally, once a tool is selected, she gives it time to work before abandoning it (i.e., persistence).

We found preliminary support for our hypotheses across five regression models. Repertoire size was negatively associated with BPD features and positively associated with Conscientiousness, in line with our hypotheses. However, repertoire was not related to Neuroticism, Extraversion, or symptoms of depression, contrary to our hypotheses. Further, repertoire size was not as consistently or strongly associated with personality dimensions or psychopathology symptoms as adaptiveness or strategy persistence. This pattern of results is consistent with Cheng et al.'s (2014) meta-analysis in which repertoire size was positively associated with adaptive outcomes, but less strongly than other emotion regulation flexibility definitions. These findings suggest that simply generating a variety of strategies may not be the most influential aspect of emotion regulation.

In line with our hypotheses, more adaptive emotion regulation strategies were associated with more adaptive personality dimensions and lower levels of BPD features. This is consistent with previous research suggesting that putatively adaptive emotion regulation strategies are associated with lower Neuroticism, higher Extraversion, and Conscientiousness (Gross & John, 2003), and lower levels of psychopathology (Aldao et al., 2010). Although in the expected direction, adaptiveness was not significantly related to symptoms of depression, contrary to our hypotheses. Given that depression symptoms were most highly correlated with Neuroticism, it may be inferred that depression symptoms would relate similarly to adaptiveness. Because the size of the association between adaptiveness and depression symptoms was almost identical to that between adaptiveness and Neuroticism, we believe the lack of a statistically significant association between adaptiveness and depression symptoms may be most likely attributable to the more variable state-based nature of our measure of depression symptoms compared to the trait-based measure of Neuroticism.

Finally, more persistent strategy use was associated with lower Neuroticism, higher Conscientiousness, and lower levels of psychopathology, in line with our hypotheses. These findings are consistent with previous work indicating Conscientiousness and Neuroticism are associated with self-reported persistence (Abuhassan & Bates, 2015). These associations suggest that frequent changes in strategy use may indicate erratic, “flailing” efforts to regulate emotions with effective strategies (Conklin, Bradley, & Westen, 2006). Although in

the expected direction, more persistent strategy use was not significantly related to Extraversion. Given that these vignettes described a variety of social and non-social scenarios, it may be that those higher in Extraversion who tend to be more social were less persistent in response to negative feedback during non-social scenarios but more persistent in response to negative feedback during social scenarios.

Alternatively, participants who persisted longer with certain strategies may have used more adaptive strategies. However, no two-way or three-way interaction we examined was significant. These findings make this explanation less likely, but future researchers should examine this explanation using more evocative, real-world feedback or a larger sample.

Although Birk and Bonanno (2016) found that switching strategies indicated healthy psychological functioning, our study is distinct in several ways. First, participants in our study responded to explicit negative feedback (e.g., “If that strategy is not working, what would you think or do to feel better?”), not self-generated feedback. Switching strategies may only indicate healthy psychological functioning when switching in response to internal, physiological cues. Additionally, we did not assign participants to use emotion regulation strategies as Birk and Bonanno did. Instead, participants self-generated strategies they would naturally use, enhancing the external validity of our findings.

This study expands our understanding of emotion regulation by providing the first demonstration that greater variability in strategy use across situations but greater persistence of strategy use within situations may be most indicative of psychological health. Further, each aspect of emotion regulation may be independently related to psychological health. This suggests that, for instance, people who tend to persist with strategies in a given situation, assuming similar levels of adaptiveness, may demonstrate greater psychological health than those who switch strategies more often. Someone who tends to quickly give up on talking to new people at a party and leave may exhibit worse psychological functioning than someone who tends to persist with their strategy of choice.

Our findings must be considered in light of this study’s limitations. Coders were instructed to rate strategy adaptiveness in general (i.e., without considering the specific scenario in which the strategy was used). While this method yielded results consistent with meta-analytic findings (Aldao et al., 2010; Webb et al., 2012), it precludes us from examining strategy-situation fit. Future researchers should rate the fit of strategies and situations and compare the associations to those reported here.

Because we constructed hypothetical scenarios, we do not know how participants would actually respond in these situations. However, because participants self-generated a range of putatively maladaptive strategies, these results were not likely biased by social desirability. Hypothetical scenarios are a valid measure of emotion regulation (Nelis et al., 2011) and they allowed us to standardize stressors across participants. Requesting free responses to hypothetical scenarios enhances the external validity of our findings compared to previous studies utilizing vignettes because participants were not limited in their choice of emotion regulation strategies. Future researchers should extend these research methods by testing patterns of emotion regulation in longitudinal and more ecologically valid designs.

Because we prompted participants to provide an emotion regulation strategy five times for each scenario, participants may have felt encouraged to switch strategies more frequently or generate a wider variety of strategies. This interpretation appears less likely because reporting a wider variety of strategies across situations and switching strategies more often within a given situation were associated with outcomes in opposing ways.

Collectively, these findings suggest the size of one's emotion regulation repertoire across situations, the adaptiveness of one's strategies, and the persistence with which they are applied in a given situation are important aspects of healthy emotion regulation. By assessing emotion regulation with a performance task and independent ratings of the strategies used rather than self-reported strategy effectiveness, we did not define emotion regulation *a priori* as adaptive or maladaptive. Instead, our findings suggest that persisting with a variety of generally adaptive strategies drawn from a relatively large repertoire may constitute a psychologically healthy emotion regulation profile.

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Table 1

Full text of stressful scenarios.

Text Presented
<p>1. You and your romantic partner just had a terrible fight. You've been together for a long time and you really like each other. You've argued before but this was serious. It ended with your partner yelling, "You're so selfish! I wish I never met you!" and slamming the door. You hear them get into the car and drive off.</p>
<p>2. You just got back your second midterm in an important class in your major. You were initially excited about this class because you've been dreaming of pursuing this major since high school. You did okay by your standards on the first midterm: not great but not terrible either. However, you just checked your grade for the second midterm and you failed.</p>
<p>3. Since starting at [college], you've been hanging out with a small group of friends from your dorm and your classes. Even though you haven't known them that long, you feel like you're really getting along well. Yesterday, one of them let it slip that they planned a get-together and didn't invite you.</p>
<p>4. You recently met someone who you think is attractive. You went out on a date together and you had a lot of fun. Since then, you've been texting back and forth a lot. You both planned on meeting up at a party this coming weekend. However, when you see them at the party, they're kissing someone else.</p>
<p>5. You're living with your best friend who you've known for a long time. Your schedules just don't match, though. Your friend stays up until 2:00 each night and regularly sleeps through several rounds of snoozing the alarm in the morning. This means you've been getting less sleep and you've felt more and more exhausted as the semester has gone on. Tonight, even though you tried to go to bed early because it is the night before a test, you can't sleep at all because your roommate is (loudly) pulling an all-nighter. It's now midnight.</p>
<p>6. Several months ago you applied for a loan to pay for college. You just received confirmation that you were approved for the loan and that you would receive it no later than next Monday. However, the last day to pay your college's first semester fees is Friday. If you can't pay the fees by then you won't be able to take the last classes you need to graduate.</p>
<p>7. Money has always been tight for you and your family so you decided to get a job. Your friends have gotten very well-paying jobs (for still being in school) and wonder why it's taking you so long to find one. You submitted resumes for two positions: one paying minimum wage which will just barely cover your bills and one paying twice as much in a field you're majoring in. You just found out you were hired part-time at the minimum wage job but not the higher-paying one.</p>
<p>8. You were very ambitious at the start of this semester. You enrolled in 18 credit hours of classes, rushed a fraternity/sorority, joined two other student organizations, and started a job working on the weekends. Now, in the middle of the semester, you're noticing your grades slipping and you're finding it hard to keep up with the commitments of your organizations and job. You can't stop worrying about falling behind and you're feeling overwhelmed.</p>
<p>9. It's the middle of November. Finals are coming up fast, and you have plans to take a vacation over break. You've felt feverish, headaches and body aches all over, and generally run down. The doctor said you have mono and you distinctly remember sharing a drink with one of your friends who was starting to show similar symptoms over the weekend.</p>
<p>10. You're desperately trying to get in shape for a Florida vacation you and your friends have planned. You've been dieting painstakingly and you just finished a stressful week of tests at school. Your best friend is having a birthday party tonight at your favorite restaurant and they are serving your favorite dessert. You really want to enjoy the party but you are also committed to your diet.</p>
<p>11. It's a few days after your latest midterm and you receive an e-mail from your professor. In it, he says that your test answers exactly matched those of another student sitting near you. Your professor says he is taking this very seriously and is sending this information to the Committee on Academic Misconduct, who will decide your fate.</p>

Table 2

Descriptions, frequencies, and average adaptiveness ratings of emotion regulation strategies.

Emotion Regulation Strategy	Frequency of Use <i>n</i> (%)	Adaptiveness <i>M</i> (<i>SE</i>)
Therapy/counseling <i>Seeing a therapist/counselor</i>	23 (0.3)	.99 (.01)
Planning <i>Thinking or talking with someone about how to proceed</i>	139 (1.8)	.99 (< .01)
Information gathering or sharing <i>Asking questions; seeking out facts; clarifying issues</i>	972 (12.3)	.98 (< .01)
Relationship maintenance/repair <i>Talking to someone about relationship difficulties</i>	466 (5.9)	.98 (< .01)
Social support <i>Contacting a familiar other to discuss a situation, meet an obligation, or get advice</i>	819 (10.3)	.97 (< .01)
Positive reappraisal <i>Thinking about the situation in a more positive light</i>	53 (0.7)	.95 (.01)
Putting into perspective <i>Thinking about how the situation is not as bad as it seemed</i>	111 (1.4)	.95 (.01)
Reflection <i>Thinking about factors that may have caused a situation; not focusing on what you did wrong</i>	158 (2.0)	.95 (.01)
Problem-solving (persistence) <i>Any strategy used to change the primary source of negative emotion</i>	765 (9.7)	.95 (< .01)
Prayer <i>Praying for a resolution or guidance about the situation</i>	18 (0.2)	.94 (.03)
Positive refocusing <i>Thinking of/discussing a more positive topic</i>	60 (0.8)	.94 (.02)
Problem-solving (alternatives) <i>Any strategy focused on identifying/implementing an alternative to the source of negative emotion</i>	1533 (19.4)	.92 (< .01)
Acceptance <i>Recognizing/acknowledging the facts of a situation or one's role in it</i>	371 (4.7)	.84 (.01)
Sleep <i>Napping, going to bed, etc.</i>	259 (3.3)	.72 (.02)
Exercise <i>Physical activity performed as a workout</i>	102 (1.3)	.65 (.03)
Behavioral activation	97 (1.2)	.64 (.03)

Emotion Regulation Strategy	Frequency of Use <i>n</i> (%)	Adaptiveness <i>M</i> (<i>SE</i>)
<i>Engaging in activities to stay busy</i>		
Isolation	66 (0.8)	.54 (.04)
<i>Taking time to be alone (no indication of brooding)</i>		
Suppression	149 (1.9)	.49 (.03)
<i>Ignoring thoughts or feelings; concealing an expression; trying to not think about something</i>		
Entertainment or fun activity	205 (2.6)	.46 (.02)
<i>Watching movies, listening to music, etc.</i>		
Express emotions	233 (2.9)	.41 (.02)
<i>Crying, yelling, laughing; telling someone you feel sad, angry, etc.</i>		
Leave the situation	392 (5.0)	.41 (.01)
<i>Removing yourself from a situation; admitting the goal of the situation is unachievable</i>		
Nothing; wait to feel better	284 (3.6)	.37 (.02)
<i>No specific action; e.g., waiting to feel less sad</i>		
Eating or drinking	118 (1.5)	.33 (.04)
<i>Eating food; drinking non-alcoholic beverages</i>		
Blame others	40 (0.5)	.19 (.04)
<i>Accusing someone else of causing a situation</i>		
Relationship antagonism	155 (2.0)	.17 (.02)
<i>Getting back at someone or making them angry</i>		
Catastrophizing	17 (0.2)	.15 (.05)
<i>Worrying about/focusing on the worst case outcome</i>		
Self-blame	9 (0.1)	.11 (.08)
<i>Thinking that you are at fault</i>		
Brooding	12 (0.2)	.06 (.06)
<i>Thinking over and over about how bad a situation is</i>		
Substance use	49 (0.6)	.06 (.02)
<i>Drinking alcohol, smoking, etc.</i>		
Cutting, scratching, or burning myself	1 (< 0.1)	.00 (N/A)
<i>Any self-harming behavior</i>		

* Note. Two categories coders rated but which we do not consider emotion regulation strategies are “I don’t know” ($n = 160$, 2.0%), defined as “any variant of ‘I don’t know’” and “Non-specific goal” ($n = 78$, 1.0%), defined as “any response that is an end-state such as ‘I’d be happy’”. Because our conclusions did not change if they were included or not, both were included in all regression models.

Table 3

Means, standard deviations, and correlations among variables of interest (N = 143, except where noted)

Measure	M	SD	1	2	3	4	5	6	7
1. Repertoire $\dagger$	13.82	2.69							
2. Adaptiveness $\dagger$	0.79	0.15	-.17*						
3. Persistence $\dagger$	-2.59	0.79	-.57**	.00					
4. Neuroticism	35.69	7.62	.08	-.15	-.23**				
5. Extraversion	41.13	6.69	-.07	.35**	.08	-.48**			
6. Conscientiousness	43.54	6.67	.06	.29**	.07	-.34**	.39**		
7. IIP-BPD $\ddagger$	1.20	0.63	-.03	-.19*	-.18*	.49**	-.33**	-.41**	
8. CES-D	19.71	10.31	-.01	-.15	-.15	.58**	-.46**	-.33**	.47**

*Note.** $p < .05$.** $p < .01$. $\dagger$ $n = 144$. $\ddagger$ $n = 142$.

CES-D = Center for Epidemiologic Studies – Depression scale. IIP-BPD = Inventory of Interpersonal Problems – Borderline Personality Disorder subscale.

Table 4

Linear regression models of the associations among emotion regulation, personality dimensions, and symptoms of psychopathology.

Predictor	Neuroticism				Extraversion			
	β	SE	p	95% CI	β	SE	p	95% CI
Intercept	.00	.08	.99	[-.16, .16]	.00	.08	.98	[-.16, .16]
Repertoire	-.12	.10	.24	[-.31, .08]	.05	.09	.54	[-.13, .23]
Adaptiveness	-.17	.07	.01	[-.30, -.04]	.36	.08	<.01	[.19, .50]
Persistence	-.30	.10	<.01	[-.49, -.10]	.11	.09	.22	[-.07, .29]
				Adjusted $R^2 = .07$				Adjusted $R^2 = .11$
				$F(3, 139) = 4.31, p < .01$				$F(3, 139) = 6.80, p < .01$
Predictor	Conscientiousness				IIP-BPD			
	β	SE	p	95% CI	β	SE	p	95% CI
Intercept	.00	.08	.99	[-.15, .16]	.00	.08	.98	[-.16, .16]
Repertoire	.24	.10	.02	[.02, .41]	-.25	.09	.01	[-.43, -.06]
Adaptiveness	.33	.10	<.01	[.11, .50]	-.24	.07	<.01	[-.38, -.09]
Persistence	.21	.09	.02	[.03, .36]	-.33	.10	<.01	[-.51, -.13]
				Adjusted $R^2 = .11$				Adjusted $R^2 = .09$
				$F(3, 139) = 6.65, p < .01$				$F(3, 138) = 5.82, p < .01$
Predictor	CES-D							
	β	SE	p	95% CI				
Intercept	.00	.08	.99	[-.16, .15]				
Repertoire	-.19	.11	.09	[-.40, .02]				
Adaptiveness	-.19	.12	.15	[-.45, .03]				
Persistence	-.25	.10	.01	[-.44, -.07]				
				Adjusted $R^2 = .05$				
				$F(3, 139) = 3.37, p = .02$				

Note. Regression analyses conducted with 10,000 95% percentile bootstrap resamples. IIP-BPD = Inventory of Interpersonal Problems - Borderline Personality Disorder subscale; CES-D = Center for Epidemiologic Studies - Depression scale.