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Emotion regulation (ER) is theorized to play a prominent role in the development and maintenance of Posttraumatic Stress Disorder (PTSD). Although a large literature has documented the links between several ER strategies and PTSD symptoms, recent advancements in ER research emphasize the need to move beyond the treatment of ER strategies as isolated processes. Instead, there is a growing movement to understand ER repertoires, or the patterns in which trauma-exposed individuals select and deploy the multiple ER strategies available to them based on the demands and opportunities imposed by the situation. Accordingly, the nuanced information derived from attending to and understanding one's emotional experiences might play a key role in facilitating the effective selection and implementation of ER strategies. The current study examined person-centered repertoires of the habitual use of eleven ER strategies among 372 undergraduates exposed to Criterion A trauma – and their relations to PTSD symptoms and two key facets of emotional awareness (attention to emotion and emotional clarity). Latent profile analysis yielded a three-profile solution (Adaptive, Average, and Maladaptive Regulators) and profile differences were evident with respect to PTSD symptoms and emotional clarity, but not attention to emotion, even after adjusting for negative affect. Findings suggest that successful identification and understanding of one's emotions might help foster healthy use of ER strategies and buffer against the development of PTSD among trauma-exposed individuals.

REPERTOIRES OF HABITUAL EMOTION REGULATION STRATEGY USE IN  
TRAUMA-EXPOSED UNDERGRADUATES: ASSOCIATIONS WITH PTSD  
SYMPTOMS AND EMOTIONAL AWARENESS

by

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## CHAPTER I

### INTRODUCTION

Posttraumatic Stress Disorder (PTSD) is a chronic and debilitating psychiatric condition with a lifetime prevalence of 8.3% in the United States adult population (Kilpatrick et al., 2013). The public health costs of PTSD are staggering, with economic estimates of productivity losses alone exceeding three billion dollars annually (Kessler, 2000). Despite statistics demonstrating that most individuals are exposed to at least one – and often several – traumatic events over the course of their lifetime (Ogle, Rubin, Berntsen, & Siegler, 2013), the majority of people do not develop PTSD (Grados, 2007). Much research has therefore focused on the cognitive, emotional, and social determinants of PTSD in order to enhance prevention and treatment efforts. The burgeoning area of emotion regulation, for example, appears to play a key role in the maintenance of posttraumatic stress and represents one promising area of inquiry.

#### **Emotion Regulation and PTSD**

Emotion regulation (ER) is a complex construct broadly referring to a diverse set of strategies used to modulate – that is, increase, decrease, or maintain – the course of an emotion with respect to its valence, intensity, and/or duration (Gross 1998, 2015; Thompson, 1994). Several ER strategies have been robustly implicated in PTSD. In fact, theoretical models posit that one commonly investigated strategy – avoidance – plays a critical role in the onset, maintenance, and treatment of PTSD (Foa, Hembree, &

Rothbaum, 2007; Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989). Seligowski and colleagues (2015) recently conducted a meta-analysis on cross-sectional research and found moderate-to-large effect sizes for associations between PTSD symptom severity and several ER strategies including rumination, thought suppression, experiential avoidance, expressive suppression, and worry ( $r$ s ranging from .28 to .53). Several studies have provided prospective evidence for the association between ER strategies and PTSD as well. For example, Kumpula and colleagues (2011) found that pre-trauma experiential avoidance predicted PTSD symptoms following exposure to a mass shooting. Similarly, using ecological momentary assessment, Short, Boffa, Clancy, and Schmidt (2018) found that increased use of rumination, avoidance, and thought suppression predicted more severe PTSD symptoms later in the day after controlling for morning PTSD symptoms. Lastly, evidence for ER strategies as a maintenance factor for PTSD comes from the treatment literature, which demonstrates that PTSD treatments may help foster healthier ER habits. For example, Boden and colleagues (2013) showed that following group Cognitive Processing Therapy, military Veterans evidenced reductions in thought suppression, which in turn predicted decreases in PTSD symptoms. Similarly, Wisco, Sloan, and Marx (2013) found reductions in rumination following Written Exposure Therapy in a sample of motor vehicle accident survivors. Together, these studies suggest that ER strategies play an important role in the maintenance of PTSD.

Prevailing theoretical conceptualizations of ER have emerged from an interactionist perspective that emphasizes the need for continuous *individual* adaptation across *situational* challenges (Gross, 1998, 2015; Gross & Thompson, 2007; Thompson,

1994). Despite the dynamic lens from which ER was conceived, however, the dominant empirical paradigm involves assessing individuals' self-reported frequency of habitual selection and implementation of strategies used to typically modify emotions across situations (e.g., Aldao, Nolen-Hoeksema, & Schweizer, 2010). This static approach to studying ER strategies has in part contributed to discrete local literatures focusing on individual ER strategies and their associations with psychopathology (Aldao & Nolen-Hoeksema, 2010; Conklin et al., 2015). Emerging from this work came the influential empirical classification system of ER strategies as either adaptive or maladaptive based on their shared associations with psychopathology, including PTSD (Aldao et al., 2010). For example, strategies including experiential and behavioral avoidance, thought suppression, rumination, worry, expressive suppression, and self-medication are classified as maladaptive and share positive associations with PTSD symptom severity (Haller & Chassin, 2014; Lee, Witte, Weathers, & Davis, 2015; Seligowski, Lee, Bardeen, & Orcutt, 2015). By contrast, strategies such as acceptance, reappraisal, and social support seeking are considered adaptive and demonstrate negative associations with PTSD symptom severity (Lee et al., 2015; Seligowski et al., 2015; Tsai, Harpaz-Rotem, Pietrzak, & Southwick, 2012).

### **Emotion Regulation Repertoires in PTSD**

Recently, ER conceptualizations (Aldao, 2013; Aldao, Sheppes, & Gross, 2015; Bonanno & Burton, 2013; Kashdan & Rottenberg, 2010) and research (Birk & Bonanno, 2016; Bonanno, Papa, Westphal, & Coifman, 2004; Kashdan et al., 2014; Sheppes et al., 2014; Sheppes, Scheibe, Suri, & Gross, 2011; Troy, Shallcross, & Mauss, 2013;

Westphal, Seivert, & Bonanno, 2010) have diverged from ascribing efficacy judgments to particular strategies. Instead, this work has returned to the interactionist perspective that highlights the importance of the flexible deployment of strategies based on situational demands. In other words, the extent to which a strategy helps garner ER goals depends not on whether that strategy is “adaptive” or “maladaptive”, but on how well that strategy is suited to the meet the challenges and opportunities imposed by the situational context. Accordingly, successful ER in part depends on ER strategy repertoires, or the ability to access a diverse set of ER strategies. If large and heterogeneous repertoires of ER strategies are accessible, flexible ER can be achieved by effectively matching ER strategy selection and implementation to the demands and opportunities presented by the environment. In other words, repertoires are a necessary but insufficient condition for flexible emotion regulation. Finally, ER flexibility may be either adaptive or maladaptive. ER flexibility confers adaptation if it increases the probability achieving one’s ER goals and maladaptive if it decreases the probability of attaining ER goals (Aldao et al., 2015; Bonanno & Burton, 2013). Thus, much like ER repertoires, ER flexibility is a necessary but not completely sufficient condition for adaptation. In the present study, I focus on the broadest level of this sequence – the extent to which trauma-exposed individuals are able to access a large and diverse pool of ER strategies (i.e., ER repertoires).

Preliminary support for the idea of ER strategy repertoires comes from findings suggesting that people regulate their emotions in heterogeneous ways and that different strategies co-occur and interact in complex patterns (Aldao & Nolen-Hoeksema, 2013; Brans, Koval, Verduyn, Lim, & Kuppens, 2013). For example, Heij and Cheavens

(2014) found across a 10-day ecological momentary assessment period that healthy individuals report using broad repertoires of 15 to 16 strategies to regulate their negative and positive emotional experiences. Patterns of ER use also hold important implications for psychosocial well-being. Aldao and Nolen-Hoeksema (2012) showed in a large community sample that adaptive strategy use was cross-sectionally associated with fewer symptoms of depression, anxiety, and alcohol problems, but only when high levels of maladaptive strategy use was present. Based on these results, the authors concluded that individuals with greater ER strategy repertoires might be more adept at implementing strategies in synchrony with contextual demands, and thus experience healthier outcomes. Blanke et al. (2019) extended these findings via a series of four experience sampling studies in healthy individuals. Data converged to show that, across time and people, greater between-strategy variability in daily life (i.e., selecting among particular strategies at one time point) was considerably more effective in reducing negative affect than was either the consistent use of the same strategy across time or employing multiple strategies at the same time point.

Moreover, evidence suggests that impaired ER strategy repertoires may be an essential factor to consider in the development and maintenance of PTSD. To assess this idea, Levi-Gigi and colleagues (2016) conducted an experiment on flexible strategy use in a sample of active-duty firefighters exposed to repeated trauma. Specifically, participants were presented with a series of pairs of negative emotional pictures matched on their content but differing on their levels of emotional intensity. Participants were instructed to select and implement either distraction or reappraisal in response to each

picture. The mechanism underlying this paradigm is that healthy individuals behave in ways that are consistent with the effectiveness of ER strategies. Based on previous work in healthy populations (e.g., Sheppes et al., 2014; Sheppes, Scheibe, Suri, & Gross, 2011), reappraisal is highly preferred in low intensity conditions because it reduces negativity and promotes emotional processing that is important for long-term adjustment. By comparison, distraction – a strategy that inhibits emotional processing – is more successful in reducing negativity in high intensity conditions. Thus, flexibility is gauged as the maximum shift between selecting and implementing reappraisal in low intensity conditions versus distraction in high intensity conditions. In their trauma-exposed sample, Levi-Gigi et al. (2016) found that the positive association between trauma exposure and PTSD symptoms was only significant among firefighters who were low in regulatory flexibility; that is, *only* among those who inflexibly or indiscriminately utilized one strategy over the other was trauma exposure associated with PTSD. Taken together with prior findings using healthy populations, this study suggests that trauma-exposed individuals with narrow ER strategy repertoires, and particularly those with a pronounced inability to select and implement strategies comprising these repertoires within a given situation, may be considerably more likely to develop PTSD symptoms.

### **Assessing ER Repertoires Using Self-Report**

Although laboratory methods maximize internal validity and experimental control, the practical constraints of lab-based measurement make obtaining large sample sizes and the assessment of an ecologically valid representation of what individuals use in daily life difficult (Brans et al., 2013; Heij & Cheavens, 2014). An alternative approach

to assess strategy repertoires, or the nuanced patterns in which individuals self-report accessing ER strategies, involves the person-centered analysis of well-established frequency-based measures of ER (Chesney & Gordon, 2017; Chesney, Timmer-Murillo, & Gordon, 2019; De France & Hollenstein, 2017; Dixon-Gordon, Aldao, & De Los Reyes, 2015; Eftekhari, Zoellner, & Virgil, 2009; Loughheed & Hollenstein, 2012). Person-centered approaches use the individual as the unit of analysis, with the goal of identifying homogeneous subgroups within heterogeneous samples based on multiple indicators. This approach holds the distinct advantage of providing nuanced information about relationships between variables within individuals as opposed to generalizing across individuals (Hagenaars & McCutcheon, 2002). Extant research using person-centered approaches to identify ER repertoires is briefly summarized below and detailed in Table 1.

There is considerable heterogeneity in the profiles of ER repertoires emerging across studies. The most frequently observed are Adaptive Regulator and Maladaptive Regulator profiles. Adaptive Regulators are characterized by high use of adaptive strategies and low use of maladaptive strategies, whereas Maladaptive Regulators report high use of maladaptive strategies and low use of adaptive strategies. Adaptive and Maladaptive profiles are associated with low and high symptoms of depression and anxiety, respectively (Chesney et al., 2019; De France & Hollenstein, 2017; Dixon-Gordon et al., 2015; Eftekhari et al., 2009). Profiles of High, Average, and Low Regulators, as well as strategy-specific profiles (e.g., “Suppression Propensity”; De France & Hollenstein, 2017) emerge less consistently and display variable relationships

with psychopathology symptoms. Tentative results suggest, however, that the High Regulator profile (i.e., elevated use of all strategies) is associated with high levels of depression and anxiety (Chesney et al., 2019; Dixon-Gordon et al., 2015). This finding is consistent with the results of Blanke et al. (2019), who showed that those who reported high use of multiple ER strategies experienced greater levels of negative affect. The High Regulator profile may therefore characterize a group of “over-regulators” who report using multiple strategies to regulate a single emotional experience. This profile could reflect a series of unsuccessful iterative attempts at regulating distress across ER strategies. Similarly, strategy-specific profiles may reflect a group of individuals who inflexibly rely upon a limited number of strategies to regulate emotion. Low and Average Regulators, by contrast, report fewer symptoms of distress (De France & Hollenstein, 2017; Dixon-Gordon et al., 2015; Loughheed & Hollenstein, 2012). These profiles may instead reflect groups of people who are either not consistently implementing any one strategy across context – a marker of flexible strategy application – or simply experiencing lower levels of distress that require little regulatory effort.

To date, only one ER profile study has focused on PTSD symptoms in a trauma-exposed sample. Chesney and Gordon (2017) conducted a cluster analysis on six ER strategies (reappraisal, acceptance, expressive suppression, avoidance, problem solving, and rumination) in a sample of 100 trauma-exposed community members. Consistent with most person-centered investigations of strategy repertoires, the authors observed an Adaptive Regulator and a Maladaptive Regulator profile. An “Active” and a “Detached” profile also emerged in this sample. Active Regulators reported frequent use of all



strategies except for suppression. Detached Regulators also reported frequent use of all strategies plus elevated levels of suppression and lower levels of problem solving. With respect to PTSD symptoms, Maladaptive Regulators reported the most severe PTSD symptoms and the Detached profile reported more severe symptoms than Adaptive Regulators, who reported the least severe PTSD symptoms. No differences were observed between the Adaptive and Active profiles or the Active and Detached profiles. Notably, no between profile differences were observed with respect to frequency of trauma exposure.

A growing body of theoretical and empirical work suggests that larger and more diverse strategy repertoires are essential for successful ER (Aldao et al., 2015; Bonnano & Burton, 2013). Conversely, a limited and less diverse repertoire of ER strategies may play an important role in the maintenance of PTSD (Chesney & Gordon, 2017; Levi-Gigi et al., 2016). The current study sought to build upon previous work investigating ER strategy repertoires in a trauma-exposed sample in a number of important ways. First, the present study uses a larger set of eleven ER strategies selected based on their well-established relations with PTSD (Haller & Chassin, 2014; Lee et al., 2015; Seligowski et al., 2015; Tsai, Harpaz-Rotem, Pietrzak, & Southwick, 2012) and to better reflect what individuals report using in daily life (Brans et al., 2013; Heiy & Cheavens, 2014). Second, based on emerging concerns about the “worst-event” method for assessing self-reported trauma history (see Methods; Bardeen & Benfer, 2019), the current study uses a novel and methodologically rigorous approach to assess self-reported trauma exposure. This includes a written narrative and follow-up questions for each event endorsed to

ensure appropriate identification of *DSM-5* (APA, 2013) PTSD Criterion A trauma.

Third, the current study incorporates a more refined set of ER measures that distinguish between subtypes of avoidance, suppression, and rumination to clarify emerging profiles. Fourth, this study assesses a considerably larger sample using a more advanced person-centered statistical technique (i.e., latent profile analysis), which holds a number of distinct advantages over cluster analysis (for a review see Pastor, Barron, Miller, & Davis, 2007). Finally, this study accounts for the potentially confounding effect of negative affect. Fluctuations in subjective distress may place differential demands on regulatory efforts and the strategies used to manage this distress. Unsurprisingly, negative affect has been associated with both PTSD symptoms and ER strategies (e.g., avoidance; Lee et al., 2015; Tull et al., 2007). Thus, covarying for negative affect is important to ensure that associations between ER repertoires and PTSD symptoms are not due to general distress.

Based on previous work, at least three profiles are anticipated. First, Adaptive Regulators are expected to report high use of adaptive strategies and low use of maladaptive strategies. Second, Maladaptive Regulators are expected to report high use of maladaptive strategies and low use of adaptive strategies. Finally, Average Regulators are expected to report moderate use across all strategies. Based on a small body of past research, strategy-specific profiles and profiles characterized by High and Low use across all strategies might also be expected (Chesney et al., 2019; De France & Hollenstein, 2017; Dixon-Gordon et al., 2015). However, due to their inconsistent emergence across studies, I do not have strong predictions related to these profiles. Based on past research

and theory, it is expected that Adaptive Regulators will report the least severe PTSD symptoms and the Maladaptive Regulators will report the most severe PTSD symptoms. Should they emerge, it is also expected that High Regulators and strategy-specific profiles will evidence elevated PTSD symptoms relative to Average and Low Regulators.

### **The Role of Emotional Awareness: Attention and Clarity**

Studies investigating strategy repertoires in trauma-exposed samples have focused on how repertoires are associated with PTSD symptom severity (Chesney & Gordon, 2017; Levi-Gigi et al., 2016). By contrast, research has yet to consider factors that contribute to the formation of ER repertoires in this population. One compelling hypothesis proposed in the ER literature is that the nuanced information derived from successfully attending to and understanding one's emotional experiences fosters the effective selection and implementation of ER strategies (Barrett & Gross, 2001; Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003). Thus, individual differences in attention to emotion (i.e., the extent to which individuals attend to and value their emotions) and emotional clarity (i.e., the extent to which individuals clearly identify, differentiate between, and understand their emotional experiences) are hypothesized to be critical in the formation of ER strategy repertoires.

Research has indicated that attention to emotion (henceforth 'attention') and emotional clarity (henceforth 'clarity') are two distinct, stable dimensions of emotional awareness underling higher-order constructs such as alexithymia and emotional intelligence (Coffey, Berenbaum, & Kerns, 2003; Gohm & Clore, 2000, 2002). Compared to those who report higher levels of attention and clarity, individuals who

report low attention and clarity are more limited in their ability to select adaptive strategies such as acceptance and reappraisal and more frequently implement maladaptive strategies such as suppression and avoidance (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Boden & Thompson, 2015; Ehring & Quack, 2010; Gross & John, 2003; Tull & Roemer, 2007). These individuals are more likely to subjectively experience affect as more intense and variable and to misinterpret physiological sensations that accompany emotional arousal (Boden, Thompson, Dizen, Berenbaum, & Baker, 2013; Taylor, Bagby, & Parker, 1997). Accordingly, those lower in attention and clarity report less successful management of emotions as well as more severe reports on a range of emotional problems, including PTSD, both directly and indirectly via ER strategy use (Barrett, Gross, Christensen, & Benvenuto, 2001; Boden & Thompson, 2015; Boden et al., 2012; Vine & Aldao, 2014; Vine, Aldao, & Nolen-Hoeksema, 2014). Taken together, this research implicates emotional awareness as a key factor that contributes to the successful regulation of emotion and mental health outcomes broadly.

Examining how emotional awareness is related to ER strategy repertoires may be relevant in the context of PTSD for a number of reasons. Meta-analytic findings have identified large effects for the positive association between PTSD diagnosis and alexithymia, which is in part comprised of low attention and clarity (Frewen, Dozois, Neufeld, & Lanius, 2008). Moreover, research has found that clarity predicts PTSD symptom severity over and above attention and other aspects of alexithymia and emotion dysregulation (Ehring & Quack, 2010; Tull et al., 2007). Boden and colleagues (2012) extended these results to show that clarity predicts PTSD after covarying for attention in

a diagnosed sample of military Veterans. Further, the authors showed that higher levels of clarity interacted with more frequent use of cognitive reappraisal to predict decreased PTSD severity. Consistent with the importance of regulatory flexibility in response to trauma (Bonanno, Pat-Horenczyk, & Noll, 2011; Levi-Gigi et al., 2016), Boden et al. (2012) suggested that increased emotional clarity may help individuals identify situations for which engaging with emotions generally and emotions related to trauma-cues and symptoms specifically is adaptive.

Consistent with this line of reasoning, levels of emotional awareness among trauma-exposed individuals may be an important determinant in the formation of ER repertoires. Specifically, a decreased ability to attend to and understand emotional experiences may contribute to repertoires comprised of (1) an overuse of strategies characterized by disengaging from emotional material and an underuse of strategies characterized by engaging with emotional material (maladaptive regulation); (2) elevated use across all strategies (over-regulation); and (3) an overreliance on single ER strategies (inflexible regulation). By contrast, higher levels of emotional awareness may foster repertoires consisting of (1) elevated use of strategies characterized by emotional engagement and decreased use of strategies characterized by emotional disengagement (adaptive regulation) and (2) low and/or average use across all strategies reflecting previously described patterns of healthy regulation (low/average regulation). Finally, given previous findings in trauma-exposed populations (Boden et al., 2012; Ehring & Quack, 2010; Tull et al., 2007) and emotion theory more broadly suggesting that attention is a necessary precursor, but not by itself sufficient for clarity (Boden & Thompson,

2017), it was also expected that the associations between emotional awareness and ER repertoires would be considerably larger for clarity than for attention.

### **Goals and Hypotheses**

Given the importance of ER in the maintenance of PTSD, synthesizing traditionally isolated bodies of literature to yield a person-centered framework of ER repertoires is warranted. The first goal of the current study will be to assess ER repertoires through examination of eleven habitually used ER strategies identified as salient to the maintenance of PTSD (i.e., brooding, reflection, worry, acceptance, experiential avoidance, behavioral avoidance, reappraisal, expressive suppression, thought suppression, social support seeking, and self-medication) in a large sample of trauma-exposed individuals. The second goal of this study will be to examine how these repertoires are differentially related to PTSD symptoms. The final goal of this study will be to investigate the understudied yet logically compelling hypothesis that emotional awareness (i.e., attention and clarity) facilitates the effective selection and implementation of ER strategies, as reflected by repertoire profiles. This research has the potential to (1) elucidate the patterns in which trauma-exposed individuals select and implement ER strategies; (2) offer insight into how ER repertoires – rather than specific strategies – contribute to the maintenance of PTSD symptoms; and (3) identify theorized factors that are differentially predictive of repertoire type. Based on the study goals, hypotheses are as follows:

*Hypothesis 1:* At least 3 distinct profiles of ER repertoires will comprise the sample – an Adaptive Regulator profile characterized by high use of adaptive strategies

and low use of maladaptive strategies, a Maladaptive Regulator profile characterized by high use of maladaptive strategies and low use of adaptive strategies, and an Average Regulator profile characterized by moderate use across all strategies. Additionally, it is expected that High Regulator, Low Regulator, and strategy-specific profiles (e.g., “Suppression Propensity”; De France & Hollenstein, 2017) may emerge as well. However, because of their inconsistent emergence in a limited body of past work, I do not have a strong prediction related to these possible profiles.

*Hypothesis 2:* After covarying for negative affect, it is expected that PTSD symptoms will be most elevated among Maladaptive Regulators, least elevated among Adaptive Regulators, and minimally elevated among Average Regulators.

*Hypothesis 3:* After covarying for negative affect, it is expected that attending to emotion and emotional clarity will be highest among Adaptive Regulators and lowest among Maladaptive Regulators.

## CHAPTER II

### METHOD

#### **Participants**

Participants were undergraduates recruited from one of two institutions located in Greensboro, North Carolina – the University of North Carolina at Greensboro and Guilford Technical Community College. Using the G\*Power analytic program (Faul, Erdfelder, Buchner, & Lang, 2009), a priori power analyses indicated that at 80% power and  $\alpha = .05$ , a sample of 349 individuals was needed to detect small-to-medium effects (.15) for two-tailed bivariate normal correlations. Oversampling procedures were employed to ensure that the current sample was sufficiently powered after accounting for random responding (i.e., up to 10% of any given the sample; Maniaci & Rogge, 2014) and lack of *DSM-5* Criterion A trauma exposure (see Procedures). An initial sample of 634 participants was recruited for the present study. The attention check revealed that 153 (24.1%) participants responded to questions in a manner that was either infrequent or inconsistent and were excluded from analyses. Further, following coding procedures, 107 (16.9%) participants were identified as having reported exposure to no traumas that met *DSM-5* PTSD Criterion A and were also excluded from analyses. This yielded a final sample of 374 participants included in final analysis. Sample demographics and trauma exposure characteristics are provided in Table 2.



## Measures

### *Problematic Responding*

**Inconsistency and infrequency.** The Attentive Responding Scale (ARS-18; Maniaci & Rogge, 2014) was used to detect extremely inconsistent and/or infrequent response patterns. The ARS-18 is broken into two matched halves embedded at different points within the study survey. Respondents rate each item on a 5-point Likert scale ranging from 0 (*Not at all true*) to 4 (*Very true*). The inconsistency subscale of the ARS is comprised of six item pairs (e.g., “*I enjoy relaxing in my free time*” and “*In my time off I like to relax*”). Absolute differences between item pairs are then summed. Based on established cutoff criteria, scores above 6.5 on the inconsistent subscale are deemed inconsistent (Maniaci & Rogge, 2014). The infrequency subscale is comprised of six items (e.g., “*My favorite subject is agronomy*”) summed to create a composite infrequency score. Composite scores falling above the threshold of 7.5 are considered reflective of infrequent responses based on established cutoffs (Maniaci & Rogge, 2014). Participants scoring above the cutoff score on either or both the inconsistency or infrequency subscales were considered problematic responders and excluded from the current analysis.

### *Trauma Exposure and PTSD Symptoms*

**Trauma exposure.** Using procedures outlined by Bardeen & Benfer (2019), the modified version of the 17-item Life Events Checklist for *DSM-5* (LEC-5; Weathers, Blake, et al., 2013) was used to assess for exposure to potentially traumatic events. The first 16 items of this self-report measure query exposure to events known to result in

posttraumatic stress and the last item assesses exposure to events not captured in the first 16 items. For each item, respondents indicated whether they (a) directly or indirectly experienced the event; (b) witnessed the event; (c) learned about the event; (d) were exposed to event through their job; (e) are unsure of their level of exposure; and (f) were not exposed to the event. Participants who directly or indirectly experienced an event were asked to provide a brief narrative describing the event and to complete a series of follow-up questions about the event (e.g., time since trauma). Participants endorsing exposure to more than one event were asked to select an index trauma, or the event that was most distressing. Trauma narratives for each event were coded by the present author, reviewed by a clinical psychologist with expertise in trauma exposure and PTSD, and assessed in conjunction with follow-up questions to determine whether the event met Criterion A standards for *DSM-5* PTSD (APA, 2013). This novel method for assessing trauma exposure via the LEC-5 has been validated in recent work (Bardeen & Benfer, 2019). Further, to ensure the reliability of coding trauma exposure, 50 participants (13.4%) were randomly selected and independently coded by an advanced research assistant trained to differentiate Criterion A from non-Criterion A events. Inter-rater reliability (assessed using Cohen's  $\kappa$ ) between the two raters was excellent. On average  $\kappa$  was .95 across the 17 event categories on the LEC (range  $\kappa$  = .86-1.00). Although the LEC-5 itself has not been psychometrically validated, few differences exist between the LEC-5 the original LEC developed for *DSM-IV*, which has demonstrated good convergent validity with measures assessing exposure to PTEs and trauma-related psychopathology (Gray, Litz, Hsu, & Lombardo, 2004).

**PTSD symptoms.** The PTSD Checklist for *DSM-5* (PCL-5; Weathers, Litz, et al., 2013) is a self-report, 20-item measure that assesses each of the *DSM-5* PTSD symptoms on a 5-point Likert scale ranging from 0 (*Not at all*) to 4 (*Extremely*). For this study, participants were asked to rate items in a trauma-general fashion based on the degree to which each symptom has bothered them over the past month. Instead of “*Thinking about the worst event*” selected on the LEC-5, participants were prompted to “*Think about the stressful experience(s)*” they endorsed on the LEC-5 to answer items on the PCL-5. The PCL-5 yields a total index of PTSD severity ranging from 0 to 80 with higher scores indicating more severe PTSD symptom severity. The PCL-5 has demonstrated good test-retest reliability, internal consistency, and convergent and discriminant validity in past studies (Blevins, Weathers, Davis, Witte, & Domino, 2015; Weathers, Litz, et al., 2013). Internal consistency on the PCL-5 was excellent ( $\alpha = .95$ ).

#### *Emotional Awareness and Negative Affect*

**Emotional awareness (attention and clarity).** Consistent with past work using factor analytic and structural equation modeling approaches (Boden & Thompson, 2015; Palmieri et al., 2009), attention to emotion and emotional clarity were assessed by combining items from two extant, well-established scales – the Toronto Alexithymia Scale-20 (TAS-20; Bagby et al., 1994) and the Trait Meta-Mood Scale (TMMS; Salovey et al., 1995). The 20-item TAS-20 and the 48-item TMMS were both be administered in full. As recommended by Palmieri and colleagues (2009), attention to emotion was assessed using eight items from the attention subscale of the TMMS and two reverse-coded items from the externally-oriented thinking subscale of the TAS-20 (e.g., “I don’t

pay much attention to my feelings”). Similarly, emotional clarity was assessed using eight items from the clarity subscale of the TMSS and five reverse-coded items from the difficulty identifying feelings subscale of the TAS-20 (e.g., “I am often confused about what emotion I am feeling”). All items were rated on a 5-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Items were summed to yield a total score such that higher scores on each scale represent higher levels of each emotional awareness construct. Reliability scores were good for emotional awareness and clarity ( $\alpha = .82$  and  $.91$ , respectively).

**Negative affect.** Negative affect was assessed using its respective subscale of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Although the full 20-item measure was administered, only the 10-item negative affect subscale was used in this study. Respondents rate the degree to which they experienced a number of negative affective states in general or on average (e.g., “*Upset*”, “*Irritable*”) on a five-item scale ranging from 1 (*Very slightly or not at all*) to 5 (*Extremely*). Higher scores indicate greater negative affect. Cronbach’s alpha on the negative affect subscale was good ( $\alpha = .88$ ).

#### *Emotion Regulation Strategies*

**Brooding and reflection (rumination).** The Ruminative Response Scale (RRS; Nolen-Hoeksema, 1991) is a 22-item self-report scale derived from the Response Style Questionnaire assessing trait rumination in response to depressed mood. After removing 12 items on the RRS due to high content overlap with depressive symptoms, Treynor et al. (2003) identified two distinct ruminative subscales independent of depressed mood:

Brooding and Reflection. Participants were asked to rate the extent to which they habitually engage in these ruminative responses on a 4-point Likert scale (1 = *Almost Never* to 4 = *Almost Always*). The brooding subscale (5 items) of the RRS (RRS-B) reflects a habitual tendency to passively perseverate on the causes, consequences, and meaning of one's distress and includes items such as "*Think 'Why can't I handle things better?'*". The reflection subscale (5 items) of the RRS (RRS-R) assesses the habitual tendency to engage in a potentially more adaptive form of self-reflection that is thought to facilitate a problem-solving orientation. The reflection subscale is comprised of items such as "*Go away by yourself and think about why you feel this way*". The brooding and reflection subscales have each demonstrated good internal validity, consistency, and reliability (Nolen-Hoeksema, 1991; Treynor et al., 2003). In the current study, the brooding and reflection subscales evidenced adequate internal consistency (.86 and .83, respectively).

**Worry.** The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) is a self-report measure of trait worry consisting of 16-items (e.g., "*I am always worrying about something*") rated on a 5-point Likert scale ranging from 1 (*Not at all typical of me*) to 5 (*Very typical of me*). Items are summed to yield a total score and higher scores on the PSWQ are indicative of increased frequency, propensity, and pervasiveness of worry. The PSWQ has demonstrated acceptable internal consistency, test-retest reliability, convergent validity with theoretically overlapping constructs (e.g., self-consciousness), and discriminant validity with psychopathology (e.g., anxiety; Meyer

et al., 1990). The PSWQ evidenced strong internal consistency in the present study ( $\alpha = .94$ ).

**Acceptance.** The Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004) is comprised of four subscales used to measure various facets of mindfulness. In the current study, the 9-item accepting without judgment subscale was administered to assess acceptance (e.g., “*I criticize myself for having irrational or inappropriate emotions*”). Each item is rated on a 5-point Likert scale (1 = *Never or Very Rarely True* to 5 = *Very Often or Always True*). Because all items on this subscale are reverse coded, lower scores on this subscale reflect greater habitual engagement in acceptance. The KIMS is a well-validated measure of mindfulness that has demonstrated good internal consistency, test-retest reliability, and convergent and discriminant validity (Baer et al., 2004). Cronbach’s alpha for the acceptance subscale was .90 in the current study.

**Behavioral and experiential avoidance.** The Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gamez, Chmielewski, Kotov, Ruggero, & Watson, 2011) was used to assess behavioral and experiential avoidance. Participants rated the extent to which they agree with a list of statements on a six-point Likert scale ranging from 1 (*Strongly disagree*) to 6 (*Strongly agree*). Only the behavioral avoidance and distress aversion subscales were administered in the current study. Behavioral avoidance was measured using its respective 11-item scale. Example items from the behavioral avoidance scale include content such as “*I work hard to avoid situations that might bring up unpleasant thoughts and feelings in me*”. The 13-item distress aversion scale was used

to measure experiential avoidance. Items on the distress aversion scale include content such as “*If I could magically remove all of my painful memories, I would*”. Higher scores indicate greater habitual engagement in behavioral and experiential avoidance. The MEAQ behavioral and experiential avoidance subscales have demonstrated excellent internal consistency, content validity, and discriminant and convergent validity (Gamez et al., 2011). Reliability on the behavioral (.86) and experiential avoidance (.88) scales was good.

**Reappraisal and expressive suppression.** The 10-item Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was used to assess habitual use of reappraisal and expressive suppression to regulate emotions. Participants rated items on a 7-point Likert scale based on the extent to which they agree or disagree with each statement (1 = *Strongly Disagree* to 7 = *Strongly Agree*). The reappraisal subscale consists of six items (e.g., “*When I’m faced with a stressful situation, I make myself **think about it** in a way that helps me stay calm*”) assessing the tendency to alter appraisals of emotionally relevant situations. The expressive suppression subscale is comprised of four items (e.g., “*I control my emotions by **not expressing them***”) reflecting the tendency to inhibit emotional expression. Higher scores on each subscale indicate greater reliance on each strategy. Both the reappraisal and expressive suppression subscales have demonstrated acceptable internal consistency, test-retest reliability, and convergent and discriminant validity with measures of theoretically related constructs (Gross & John, 2003). Internal consistency for reappraisal and expression suppression was adequate (.88 and .78, respectively) in the current study.

**Thought suppression.** The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) is a 15-item inventory used to measure thought suppression. Example items include content such as “*I always try to put problems out of my mind.*” Items are rated on a 5-point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*) and are summed to create a total score. Higher scores on the WBSI represent a greater habitual tendency to suppress thoughts. The WBSI has demonstrated excellent internal consistency, test-retest reliability, and convergent and discriminant validity with theoretically relevant constructs (Muris, Murckelbach, & Horselenberg, 1996). Cronbach’s alpha on the WBSI was excellent ( $\alpha = .91$ ).

**Social support seeking and self-medication.** The COPE Inventory (COPE; Carver, Scheier, & Weintraub, 1989) is a 60-item measure comprised of 15 subscales used to assess a range of coping strategies in response to adverse life events. Only the emotional social support (COPE-SS) and substance use (COPE-SU) subscales were administered to assess social support seeking and self-medication, respectively. Participants rated the extent to which they seek social support (e.g., “*I discuss my feelings with someone*”) or self-medicate (e.g., “*I use alcohol or drugs to make myself feel better*”) on a 4-point Likert scale ranging from 1 (*I usually don’t do this at all*) to 4 (*I usually do this a lot*). Higher scores reflect greater habitual engagement in each strategy. The COPE has evidenced good internal consistency, factorial validity, and convergent and discriminant validity (Carver et al., 1989). Internal consistency scores for the social support seeking (.89) and self-medication (.95) subscales were excellent.



## Procedures

During the Fall 2019 semester and Spring 2020 semester, the study was advertised to Psychology Subject Pool students who were least 17 years of age and could read and write in English. Respondents were recruited to participate in an online study examining individual differences in emotional experiences and emotional problems among college students. Participants 18 years or older were provided informed consent and participants age 17 provided assent after informed consent was obtained from parents or legal guardians. Participants were compensated with course credit in exchange for completing the 60-minute survey administered over the Qualtrics online survey platform. Embedded in the survey was a series of items designed to assess inattentive responding (i.e., ARS-18; Maniaci & Rogge, 2014) as screening for careless or random responding may help preserve power and attenuate threats to effect size (Meade & Craig, 2012; Maniaci & Rogge, 2014). All study procedures were approved by the university's Institutional Review Board.

The extended version of the Life Events Checklist for *DSM-5* (LEC-5; Weathers, Blake, et al., 2013) was used to assess for trauma exposure. Events were coded as meeting or not meeting the definition of a traumatic event according to *DSM-5* PTSD Criterion A (APA, 2013). Traditionally, trauma status is confirmed using the “worst-event” method, which involves screening the participant for exposure to 17 potentially traumatic events (e.g., sexual assault, motor vehicle accident), asking the participant to identify their “worst event”, and then answering a series of follow-up questions to confirm Criterion A. However, due to concerns outlined by Bardeen and Benfer (2019)

regarding substantial misidentification of trauma exposure status using this method, the current study followed novel recommendations by asking participants to complete a trauma narrative and follow-up questions following each event endorsed on the LEC-5 as described in the study Measures. Respondents who reported a traumatic event that did not meet Criterion A on the LEC-5 – along with those individuals who did not endorse exposure to any traumatic event – were excluded from the analysis. Those respondents whose worst trauma did not meet for Criterion A, but who also reported a secondary trauma that did meet for Criterion A were included in the final analysis along with participants who endorsed a worst event that met Criterion A (see Table 2).

### **Data Analytic Plan**

First, all variables were assessed for missing data, outliers, and distribution normality. Missing data were imputed via Mplus using full information maximum-likelihood estimation. Cook's distance, Leverage values, and Mahalanobis' distance were evaluated and used to detect multivariate outliers present in the data. Values exceeding cutoff criteria on at least two of these indicators were treated as outliers. Distribution normality of dependent variables was assessed using skewness and kurtosis values where values falling between  $\pm 2$  are indicative of a normal, univariate distribution.

Transformations were applied to variables falling outside this range of acceptability. An independent samples t-test was then used to confirm past research showing no differences in PTSD symptoms among those reporting a Criterion A "worst-event" versus those reporting a Criterion A secondary event (Bardeen & Benfer, 2019).

The first goal of the current study was to statistically group individuals into profiles of ER repertoires according to their self-reported frequency of using eleven regulatory strategies. Latent profile analysis (LPA), which is a model-based approach that provides fit statistics to identify the most appropriate profile solution of the data (i.e., the number and structure of profiles), was used to determine ER repertoires. LPA also provides probability and uncertainty estimates of how each person fits or does not fit into each profile, which helps optimize classification of individuals. Profiles are constructed to reflect a group of individuals whose pattern of scores across observed indicator variables is relatively homogenous. Observed indicator variables in the current study included continuous measures of eleven different ER strategies (brooding, reflection, worry, acceptance, cognitive avoidance, behavioral avoidance, reappraisal, expressive suppression, thought suppression, social support seeking, and self-medication). Mplus version 8.3 was used to conduct all subsequent analyses.

The present study used the three-step approach to latent variable modeling, which involves iteratively generating models to create latent profiles and then using those profiles to predict distal outcomes (Asparouhov & Muthen, 2013; Bolck, Broon, & Hagnaars, 2004; Vermunt, 2010). All scales were standardized prior to the LPA for ease of interpretation. To evaluate model fit, goodness-of-fit indices including the Akaike information criterion (AIC), Bayesian information criterion (BIC), and Sample Size Adjusted Bayesian Information (ABIC) were used, where lower values indicated better model fit. Model entropy, a measure of classification quality where entropy values closer to 1 indicated that individuals are effectively being classified into profiles, was also used.

Finally,  $p$ -values of .05 or less on the adjusted Lo-Mendell-Rubin likelihood ratio test (LRT) was used to test whether a model with  $k$  classes better fit the data than a model with  $k-1$  classes. Fit for each model was evaluated in relation to alternative models. The profile solution with the optimal combination of evaluation criteria outlined above and the lowest classification uncertainty was selected. Once the best fitting profile solution was selected, participants were coded as having the repertoire that had the highest probability of fitting their individual regulatory pattern, yet the uncertainty with which the individual fit that profile was also modeled.

The second and third goals of this study were to examine differences in PTSD symptoms and emotional awareness as they pertain to ER repertoires. I utilized two sets of analyses to address these goals. First, as part of the three-step approach, profile membership variables were analyzed as predictors of distal outcome variables while taking into account classification uncertainty. Chi-square tests were then used to determine whether profiles differed on distal outcomes of interest. Separate mixture models were tested for distal outcome variables including PTSD symptoms, attention to emotion, and emotional clarity. Notably, the three-step approach is unable accommodate the presence of a covariate when analyzing how profile membership predicts distal outcomes. Therefore, for analyses assessing how profile membership predicts the three distal outcomes of interest after controlling for negative affect, the profile membership group that best fit each participant (as determined by the LPA) was also saved out as a dummy coded grouping variable. PTSD, attention to emotion, and emotional clarity were then separately regressed on the dummy coded grouping variable and negative affect to

determine whether hypothesized mean differences across profiles persisted after holding negative affect constant. One limitation to this latter regression approach is the inability to model classification uncertainty. However, when entropy is high ( $>.80$ ), the removal of classification uncertainty is unlikely to bias results (A. Supple, personal communication, 19 March 2020).

## CHAPTER III

### RESULTS

#### **Preliminary Analyses**

Multivariate assessment of outliers revealed the presence of two outliers, which were excluded from analyses leaving a final  $N = 372$ . Examination of dependent variables showed that attention to emotion was negatively skewed and was therefore square-root-transformed and standardized prior to analyses. For ease of interpretation, the untransformed values are reported in tables and figures. Descriptive statistics, including means, standard deviations, ranges, skewness, and kurtosis are reported for all study variables in Table 3 and zero-order correlations are presented in Table 4.

#### **Trauma Exposure**

Prior to conducting the latent profile analyses, trauma exposure characteristics were examined as a function of whether participants endorsed a “worst” event that met Criterion A standards. Results showed that out of the 372 participants comprising the final sample, a substantial proportion of participants (138; 37.1% of the final sample) whose index trauma did not meet Criterion A also reported exposure to a secondary traumatic event that did meet Criterion A. An independent samples  $t$ -test with equal variances not assumed (Levene’s  $F = 30.93$ ,  $p < .000$ ) revealed that participants whose “worst” event met Criterion A (Criterion A index group) endorsed exposure to a greater total number of Criterion A traumatic events ( $M = 2.75$ ,  $SD = 1.85$ ) than did participants

whose “worst” event did not meet Criterion A, but had at least one other event that did meet Criterion A (the secondary trauma Criterion A group) ( $M = 1.75$ ,  $SD = 0.99$ ),  $t(367.30) = 6.73$ ,  $p < .000$ , 95% CI [.70, 1.28]. However, the index trauma Criterion A group ( $M = 21.05$ ,  $SD = 18.04$ ) did not differ from the secondary trauma Criterion A group with respect to self-reported PTSD symptoms ( $t(370) = .56$ ,  $p = .58$ ), attention to emotion ( $t(362) = -1.03$ ,  $p = .31$ ) or emotional clarity ( $t(362) = .42$ ,  $p = .67$ ). Similarly, the lack of between-group differences were robust against the 11 ER strategies ( $ts = .148$ – $1.47$ ,  $ps = .14$ – $.88$ ), with the exception of social support seeking for which those in the secondary trauma Criterion A group ( $M = 10.64$ ,  $SD = 3.42$ ) reported significantly higher rates of social support seeking than did the index trauma Criterion A group ( $M = 9.50$ ,  $SD = 3.59$ ),  $t(364) = 2.98$ ,  $p = .003$ , 95% CI [.39, 1.89]. Consequently, group membership was not considered as a relevant covariate for LPA models and examination of distal outcomes.

### **Profile Identification**

Table 5 displays fit indices for two-to-five model solutions of each latent profile analysis. Results from the Lo-Mendall-Rubin LRT indicated that a three-profile solution provided significantly better fit than a two-profile solution; both four- and five-profile solutions did not provide better fit over the three-profile solution. By comparison, AIC, BIC, and ABIC suggested that a five-profile solution better fit the data. Similarly, entropy continued to increase with four- and five-profile models reflecting better classification quality. I therefore continued to generate  $k+1$  profile solutions until AIC, BIC, and ABIC reached their minimum values and entropy reached its maximum value. The six-profile

model failed to converge reflecting a poor-fitting model. Comparing the three- and five-profile models to resolve mixed findings from global fit indices showed that the five-profile model possessed poor class discrimination because it added two low-frequency profiles (12.2% and 6.8% of the data) that essentially averaged two existing profiles from the three-profile solution. Thus, the five-profile model lacked incremental validity that would signify justification for retaining this model over the three-profile model. I therefore retained the three-profile model, which evidenced good entropy (.85) and excellent classification probabilities for each profile (.92-.93).

Unstandardized means and standard errors for the three-profile solution are reported in Table 6. For ease of interpretation, Figure 1 depicts the standardized estimates of the eleven ER strategies for each of the three profiles. In the three-profile model, participants were classified into one following profiles: (1) Average Regulators ( $n = 190$ ; 51.1%), who reported consistent average use of each ER strategy; (2) Adaptive Regulators ( $n = 103$ ; 27.7%) who evidenced above average use of acceptance, average use of cognitive reappraisal, social support seeking, expressive suppression, and self-medication, and below average levels of thought suppression, behavioral avoidance, experiential avoidance, brooding, reflection, and worry; and (3) Maladaptive Regulators ( $n = 79$ ; 21.2%), who reported above average use of brooding, worry, thought suppression, reflection, behavioral avoidance, and experiential avoidance, average use of self-medication, expressive suppression, and social support seeking, and below average use of cognitive reappraisal and acceptance.



### **Associations with Distal Outcomes (Three-Step)**

Using the three-step approach outlined above, profiles were compared on distal outcomes including PTSD symptoms, attention to emotion, and emotional clarity (see Table 7). When predicting PTSD symptoms, Maladaptive Regulators reported higher levels of PTSD symptoms than did Average Regulators ( $\chi^2 = 66.62, p < .000$ ) and Adaptive Regulators ( $\chi^2 = 174.00, p < .000$ ). Average Regulators reported significantly greater PTSD symptoms than did Adaptive Regulators ( $\chi^2 = 71.30, p < .000$ ), who evidenced the lowest levels of PTSD symptoms. When predicting attention to emotion, no differences were observed between Maladaptive, Average, and Adaptive Regulators ( $\chi^2$ s all  $< 2.46$ ,  $ps$  range .12-.74). Finally, when predicting emotional clarity, Adaptive Regulators evidenced higher levels of emotional than both Average Regulators ( $\chi^2 = 58.05, p < .000$ ) and Maladaptive Regulators ( $\chi^2 = 133.62, p < .000$ ). Average Regulators reported significantly higher levels of emotional clarity than did Maladaptive Regulators ( $\chi^2 = 39.43, p < .000$ ), who reported the lowest levels of emotional clarity.

### **Associations with Distal Outcomes (Simple Linear Regression)**

Given that model entropy was high, simple linear regression analyses were then conducted to test ER repertoire profile mean differences on distal outcomes after adjusting for negative affect. To ensure that results adjusting for mean levels in negative affect are not a biased product of failing to account for classification uncertainty, I first replicated results found in the three-step approach using SLR. Results are shown in Table 8. The ER repertoire profile membership grouping variable was dummy coded such that

Average Regulators comprised the reference group; unstandardized beta coefficients for Adaptive and Maladaptive Regulators therefore represent mean-level differences between profiles for the distal outcome of interest.

Consistent with the three-step approach, Maladaptive Regulators endorsed higher levels of PTSD than both Average and Adaptive Regulators. Average Regulators endorsed higher levels of PTSD than did Adaptive Regulators, who endorsed the lowest levels of PTSD. No differences were found between ER repertoire profiles with respect to attention to emotion. Finally, when predicting emotional clarity, Adaptive Regulators endorsed higher levels of clarity when compared to both Average and Maladaptive Regulators. Average Regulators reported higher levels of clarity than did Maladaptive Regulators, who reported the lowest levels of clarity. The SLR analyses therefore replicated the chi-square analyses derived from the three-step approach, suggesting that removal of classification uncertainty estimates did not bias results. Lastly, models were reanalyzed after adjusting for mean levels of negative affect. Mean differences on distal outcomes according to ER repertoire profile persisted with a one notable exception; for the model predicting PTSD, Adaptive and Average regulators evidenced no significant difference in mean levels of PTSD after adjusting for negative affect.

### **Post-Hoc Analyses**

In the only prior investigation of ER repertoires in a trauma-exposed sample, Chesney and Gordon (2017) identified a four-profile model (Adaptive Regulators, Maladaptive Regulators, Active Regulators, and Detached Regulators) in their sample of 100 trauma-exposed community members. Surprisingly, profiles did not differ with

respect to total trauma exposure, which is in stark contrast to research suggesting that trauma frequency and type are both positively related to emotion regulation difficulties (e.g., Ehring & Quack, 2010). To help resolve this discrepancy, I conducted a post-hoc analysis using the three-step approach outlined above to test whether emergent profiles differed with respect to total trauma exposure. Consistent with the larger literature, results indicated that Maladaptive Regulators ( $M = 2.61, SE = .20$ ) and Average Regulators ( $M = 2.59, SE = .13$ ) both reported higher rates of trauma exposure relative to Adaptive Regulators ( $M = 1.84, SE = .11$ ),  $\chi^2$ s = 11.13 and 19.66, respectively,  $ps < .000$ . No differences were observed between Maladaptive and Average Regulators ( $\chi^2 = .003, p = .96$ ). Results were replicated in simple linear regression analyses. After covarying for mean levels of negative affect ( $B = .03, SE = .01, p < .02$ ), Adaptive Regulators ( $B = -.44, SE = .21, p = .04$ ) reported significantly less total trauma exposure than Average Regulators ( $M = 1.87, SE = .32$ ), whereas Maladaptive Regulators ( $B = -.26, SE = .25, p < .31$ ) did not differ from Average Regulators in total trauma exposure.

## CHAPTER IV

### DISCUSSION

The current study extends a sparse literature examining the patterns with which trauma-exposed individuals report habitually using multiple ER strategies. Analysis of eleven ER strategies that have independently been linked to posttraumatic stress symptoms revealed three emergent profiles of ER repertoires: Average Regulators, Adaptive Regulators, and Maladaptive Regulators. Profiles evidenced differential associations with PTSD symptoms and emotional clarity, but not attention to emotion, and these associations were not due to differences in general distress. Maladaptive Regulators characterized by high use of thought suppression, worry, brooding, reflection, behavioral avoidance, and experiential avoidance, average use of expressive suppression, self-medication, and social support seeking, and low use of acceptance and cognitive reappraisal reported the highest levels of PTSD symptoms and the lowest levels of emotional clarity. Adaptive Regulators characterized by high use of acceptance, average use of expressive suppression, self-medication, and social support seeking, and low use of thought suppression, worry, brooding, reflection, behavioral avoidance, and experiential avoidance reported the highest levels of emotional clarity and the lowest levels of PTSD symptoms. No differences were observed between Average Regulators, who reported mean-level use of all strategies, and Adaptive Regulators in self-reported PTSD symptoms; however, Average Regulators reported lower levels of emotional

clarity than Adaptive Regulators, but greater clarity than Maladaptive Regulators.

Contrary to hypotheses, groups did not differ with respect how much they attend to their emotions. Together, these results suggest that trauma-exposed individuals report (1) using multiple strategies to regulate their emotions (Seligowski et al., 2015), (2) differential levels of habitual ER strategy use that meaningfully cluster into heterogeneous profiles (Chesney & Gordon, 2017; Eftekhari et al., 2009), and (3) that these profiles are differentially linked to PTSD symptoms (Levi-Gigi et al., 2016) and emotional awareness (Boden et al., 2012).

### **ER Repertoires and Trauma Exposure/PTSD Symptoms**

Despite person-centered analyses of ER strategies being a small and recent literature, there is notable heterogeneity in the numbers and types of ER repertoire profiles identified across studies (see Table 1). In this study, I failed to find evidence for Low, High, and strategy-specific profiles that have inconsistently emerged in past work. Instead, trauma-exposed individuals in this sample were best represented by a three-profile solution comprised of Average, Adaptive, and Maladaptive Regulators that have been frequently observed in person-centered studies of ER (Chesney & Gordon, 2017; Chesney et al., 2019; De France & Hollenstein, 2017; Dixon-Gorden et al., 2015; Eftekhari et al., 2009). The profiles identified in this study broadly mirror the adaptive-maladaptive framework of ER strategies proposed by Aldao et al. (2010), wherein the *habitual use* of strategies may be positively (maladaptive) or negatively (adaptive) associated with psychopathology. These profiles also dovetail with well-established individual differences in biobehavioral approach and withdrawal systems (Watson,

Wiese, Vaidya, & Tellegen, 1999), and factor analytic studies finding that between-persons habitual ER strategy use is best represented by a two-factor structure representing engagement (composed of putatively adaptive strategies) and avoidance (composed of putatively maladaptive strategies) (McMahon & Naragon-Gainey, 2019).

Results suggest that certain engagement and avoidance strategies were more effective than others in discriminating between profiles. For example, relative to cognitive reappraisal and social support seeking, variability in acceptance emerged as key strategy that distinguished between profiles. Interestingly, past work on ER repertoires has also identified acceptance as a critical engagement strategy that is important in profile emergence and differences on distal outcomes such as depression and anxiety (Chesney et al., 2019). It is noteworthy that in comparison to avoidance strategies, engagement strategies are disproportionately represented in person-centered approaches. Future research should seek to incorporate a larger selection of engagement strategies (e.g., problem solving, savoring) to further elucidate the relative contributions and importance of acceptance to psychological functioning, including PTSD. In comparison to avoidance strategies such as expressive suppression and self-medication, variability in thought suppression, worry, brooding, reflection, and behavioral avoidance were effective in differentiating profiles. These results indicate that more diffuse patterns of avoidance (e.g., cognitive, behavioral, experiential) may be equally harmful in maintaining PTSD. Notably, it is intriguing that reflection – a form of rumination conceptualized as passive problem solving (Treynor et al., 2003) – contributed to the Maladaptive Regulator profile to the extent that it did. Although rumination has been widely studied in depression and

to a lesser extent PTSD, the role of reflection and its adaptiveness as an ER strategy is still contentious (see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008 for a review).

The ER repertoires that emerged in this study evidenced intriguing associations with self-reported PTSD symptoms and trauma exposure. Consistent with past work on ER repertoires, a propensity to disproportionately implement strategies that reflect avoidant and/or perseverative styles of regulating negative emotional experiences was associated with higher PTSD symptoms and total trauma exposure. Maladaptive Regulators may find it difficult to access adaptive ER strategies amidst an overreliance on maladaptive strategies (e.g., brooding), which have been shown to interfere with the ability to shift attention away from negative emotional stimuli (Gotlib & Joormann, 2013). Thus, it may be difficult for these individuals to attend to situational context and identify instances where use of adaptive strategies is beneficial. By contrast, Adaptive Regulators reported lower PTSD symptoms and total trauma exposure, corroborating the well-established association between habitual reliance on strategies that foster engagement with negative emotional material and lower levels of psychopathology. Finally, after adjusting for mean levels of negative affect, the Average Regulator group reported similar rates of trauma exposure in comparison to Maladaptive Regulators, but comparable PTSD symptoms relative to Adaptive Regulators. The Average Regulator profile therefore lends support to the importance of ER repertoires in this sample. Although Average Regulators experienced elevations in past trauma exposure, they may be partly buffered against developing PTSD symptoms because they rely on a broader and more balanced pool of ER strategies (Aldao, Sheppes, & Gross, 2015; Bonnano &

Burton, 2013; Kashdan & Rottenberg, 2010). This profile is also consistent with the compensatory hypothesis offered by Aldao and Nolen-Hoeksema (2012), which posits that the negative effects of maladaptive strategy use are curtailed as long as adaptive strategies also being used. Going forward, it will be important to determine how trauma-exposed individuals report using strategies in daily life, select strategies relative to one another given the contextual goals at hand, and adjust strategy use based on goal-directed feedback systems. Real-time monitoring methodologies will be invaluable in identifying whether the ER repertoires identified here and in related studies generalize to state ER strategy use in daily life.

### **ER Repertoires and Emotional Awareness**

Access to a sufficiently broad and diverse array of strategies is a necessary but insufficient precursor to flexible emotion regulation. Along with a broad ER repertoire, emotion-related information accrued from attending to and understanding one's emotional experiences is believed to help facilitate the effective selection and implementation of ER strategies (Barrett & Gross, 2001; Berenbaum et al., 2003). This study is the first to simultaneously evaluate how the two core facets comprising emotional awareness – attention to emotion and emotional clarity – are uniquely and differentially associated with person-centered profiles of ER strategy use. Bivariate correlations showed that emotional clarity was more robustly associated with the eleven ER strategies of interest, in terms of both frequency and in most cases magnitude, than was attention to emotion. Further, whereas attention to emotion did not distinguish



between ER repertoires, self-reported emotional clarity varied considerably across Adaptive, Average, and Maladaptive Regulators.

In this trauma-exposed sample, Adaptive Regulators reported the highest levels of clarity, followed by Average and then Maladaptive Regulators. These results suggest that the ability to identify, differentiate between, and understand one's emotional experiences may be critical to the formation of habitual patterns of ER strategy use. Indeed, individuals with PTSD report high levels of alexithymia, which involves an impoverished system used to identify and describe emotions (Frewen et al., 2008). Cognitive models of PTSD suggest that individuals with PTSD display disturbances in autobiographical memory, negative attentional biases, excessive and overgeneralized negative appraisals of the trauma-related stimuli, and impaired executive functioning (Ehlers & Clark, 2000). These features of PTSD may contribute to individuals perceiving negative emotions in a diffuse, non-differentiated way. Given that discrete emotional states provide information about situations and their potential consequences, experiencing emotions in a clear and unambiguous manner appears crucial for regulating goal-directed behavior (Kashdan, Barrett, & McKnight, 2015). Those who are less clear about their emotions may therefore be at risk for managing those emotions poorly, as the present findings suggest. However, results from this study come with a few important caveats. The ability to understand and differentiate between discrete emotional states is considered a skill (termed emotion differentiation; Lindquist & Barrett, 2008); as such, it needs to be measured behaviorally. Although emotion clarity is theoretically equivalent trait construct, it requires people to access and analyze performance across heterogeneous situations and may better reflect

individuals' beliefs about their abilities (Boden et al., 2013). Future work will need to directly examine emotion differentiation as it pertains to ER strategy use and PTSD – a task well-suited for experience sampling studies. Additionally, the current results cannot shed light on whether poor clarity of one's emotional experiences is a risk factor for developing PTSD in response to trauma or whether poor clarity is a result of PTSD that helps maintain the disorder and improves following treatment. Despite the significant challenge of studying PTSD prospectively, longitudinal research is sorely needed to help clarify this important question.

The lack of relations between attention and ER strategies is noteworthy. Meta-analytic associations show a moderate positive correlation (summary effect = .34; Boden & Thompson, 2017) between attention and clarity, which is consistent with current findings. Emotion theories suggest that attention and clarity are independent but complementary processes whereby attention is a necessary but insufficient precursor for clarity (Berenbaum et al., 2003). Multiple studies independently link attention and clarity to ER strategy use (e.g., Boden & Thompson, 2015) and the combination of attention and clarity may play an important role in emotion regulation. Those with high attention but low clarity, relative to those with high attention and high clarity, may be most susceptible to poor emotion regulation (e.g., Gohm, 2003). However, many studies have also found small, null, or even negative associations between attention and clarity (Boden & Thompson, 2017), and links between attention and ER strategies are inconsistent (Ehring & Quack, 2010; Boden & Thompson, 2015). ER strategies are likely to differ in the extent to which they rely on attention; for example, suppression is characterized by

purposeful direction of attention away from the stimulus and emotional response whereas cognitive reappraisal requires directing attention toward emotional information (Sheppes et al., 2014). Although existing emotion theories have clearly explicated links between attention and clarity, little has been done to delineate how these facets of emotional awareness – either independently or conjointly – are uniquely related to specific ER strategies. Further, consideration of contextual (e.g., emotion-eliciting stimuli, type, or intensity) and methodological (e.g., assessment methods and instruments) moderators may be crucial to understanding the conditions under which attention contributes to clarity, ER strategy use, and well-being and psychopathology in future work.

### **Clinical Implications**

These findings on how ER repertoires are related to emotional awareness and PTSD symptoms may help elucidate the complex emotional processes linked to the maintenance of PTSD. Accordingly, these results might have important implications for the prevention and treatment of posttraumatic stress following trauma exposure. Evidence suggests that broader ER repertoires may buffer against developing PTSD among trauma-exposed individuals (Chesney & Gordon, 2017; Levi-Gigi et al., 2016). Further, training individuals to differentiate between their emotions results in increased approach behavior, decreased anxiety, and less sympathetic arousal when confronted with previously feared stimuli (Kircanski, Lieberman, & Craske, 2012). These studies provide indirect evidence that teaching individuals to label and differentiate between discrete emotional states – a technique known as affect labeling – helps reduce emotional reactivity and fosters healthy use of ER strategies. Indeed, emotional clarity and access to

broader repertoires of ER strategies may in turn help trauma-exposed individuals select strategies best suited to manage the intense distress accompanying trauma reminders, resulting in decreased avoidance behaviors and reductions in posttraumatic stress. However, prior to adopting these easily accessible and trainable skills with trauma-exposed populations, more empirical work is needed to directly establish the role of emotion differentiation and its relation to ER strategies in PTSD.

### **Study Limitations and Conclusions**

Although this study possesses several strengths, it is not without limitations. First, like every study that uses trait methods of self-report to study ER, participants must retrieve and describe their broad application of strategies to various emotional states and situations over an ambiguous timeframe. Much like emotional clarity, self-report measures of habitual use of ER strategies have been criticized for addressing general beliefs about ER ability rather than frequency of strategy use. Further, the accuracy of self-reported ER strategy use may vary as a function of emotional responding and insight (Lewis, Zinbarg, & Durbin, 2010; Berking & Wupperman, 2012). Future research should seek to standardize the assessment of habitual ER strategy use to specify temporality, measurement, and – at the very least – the valence of emotions of interest. In fact, existing measures such as the Regulation of Emotions System Survey (RESS; De France & Hollenstein, 2017) have been created for this purpose, albeit with a smaller sampling of ER strategies. Second, despite a rigorous validity check to screen out inattentive responding and careful vetting of *DSM-5* Criterion A trauma exposure, this was an undergraduate sample reporting relatively low levels of PTSD symptoms. Future studies

will need to use clinical interviews to assess for PTSD and determine whether the emergent ER repertoires identified here and their relations to PTSD symptoms and emotional awareness generalize. Third, this study used a cross-sectional design and was unable to address the temporal unfolding of ER processes in relation to PTSD. As previously described, real-time monitoring studies and long-term longitudinal investigations will be invaluable to studying how behavioral measures of emotion identification and differentiation are related to flexible ER strategy use among trauma-exposed individuals. Long-term longitudinal studies may be well equipped to determine whether habitual patterns of ER are stable across time, when they crystallize, and what factors might be important to help adjust maladaptive regulatory patterns. Experimental studies that incorporate mood inductions, manipulations of emotional clarity, and varying ER strategy conditions will also be pivotal in exploring the causal processes believed to underlie the present findings (see Sheppes, in press for a review of current theory and experimental evidence). The inclusion of physiological and behavioral measures of ER will also be invaluable to help circumvent the final limitation of this study, which is the assessment of ER strategies and emotional awareness via self-report.

Despite these limitations, this study contributes to a growing literature highlighting the importance of ER repertoires and emotional awareness to PTSD and psychological health more broadly. ER repertoires have now established as a transdiagnostic factor associated with a range of psychological and behavioral outcomes including depression, anxiety, posttraumatic stress, disordered eating, and borderline personality. Although some contention exists regarding differential profiles emerging

across studies, the Adaptive, Average, and Maladaptive Regulator profiles have now been well replicated. The present findings suggest that emotional clarity may be a critical factor in determining the formation of ER repertoires and how they are related to psychological well-being; however, future research is needed to better understand this relationships and explicate how ER repertoires and emotional awareness work together to pave the way for flexible, goal-directed emotion regulation.

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## APPENDIX A

### TABLES AND FIGURES

**Table 1. Summary of Existing Research Using Person-Centered Methods to Assess ER Strategy Repertoires.**

Source	Sample(s)	Strategies (Measures)	Analytic Method	ER Repertoires	Correlates (Measures)
Eftekhari, Zoellner, & Virgil (2009)	301 Undergraduate Females	<ul style="list-style-type: none"> <li>• Trait Reappraisal (ERQ)</li> <li>• Trait Expressive Suppression (ERQ)</li> </ul>	Cluster Analysis	<ul style="list-style-type: none"> <li>• High Regulators</li> <li>• Low Regulators<sup>1</sup></li> <li>• High Reappraisers/Low Suppressors<sup>2</sup></li> <li>• Moderate Reappraisers/Low Suppressors</li> </ul>	<ul style="list-style-type: none"> <li>• PTSD (PDS)</li> <li>• Depression (BDI)</li> <li>• State/Trait Anxiety (STAI)</li> </ul>
Lougheed & Hollenstein (2012)	177 Adolescents	<ul style="list-style-type: none"> <li>• Trait Reappraisal (ERQ)</li> <li>• Trait Suppression (ERQ)</li> <li>• Trait Concealing (ASQ)</li> <li>• Trait Adjusting (ASQ)</li> <li>• Trait Emotional Engagement (DERS)</li> </ul>	Latent Profile Analysis	<ul style="list-style-type: none"> <li>• Average Regulators</li> <li>• Adjustment Propensity</li> <li>• Suppression Propensity</li> <li>• Concealing/Suppression</li> <li>• Emotionally Disengaged</li> <li>• No Strategies<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Depression (BDI)</li> <li>• Anxiety (BAI)</li> <li>• Social anxiety (SAS-A)</li> </ul>
Dixon-Gordon, Aldao, & De Los Reyes (2015)	531 Undergraduates	Single-item ratings of: Acceptance, Reappraisal, Problem Solving, Experiential Avoidance, Expressive Suppression, Self-Criticism, and Worry/Rumination in response to six	Latent Class Analysis	<ul style="list-style-type: none"> <li>• High Regulators</li> <li>• Low Regulators</li> <li>• Adaptive Regulators</li> <li>• Worriers/Ruminators</li> <li>• Avoiders</li> </ul>	<ul style="list-style-type: none"> <li>• Anhedonic Depression and Anxious Arousal (MASQ)</li> <li>• Fear of Negative Evaluation (BFNE)</li> </ul>

			experimentally-induced stressful scenarios			<ul style="list-style-type: none"> <li>• Borderline Personality (MSI-BPD)</li> <li>• Disordered Eating (EAT-26)</li> </ul>
	Chesney & Gordon (2017)	100 Trauma-Exposed Community Members	<ul style="list-style-type: none"> <li>• Trait Acceptance (DERS)</li> <li>• Trait Reappraisal (ERQ)</li> <li>• Trait Expressive Suppression (ERQ)</li> <li>• Trait Avoidance (CRI)</li> <li>• Trait Problem Solving (CRI)</li> <li>• Trait Rumination (CERQ)</li> </ul>	Cluster Analysis	<ul style="list-style-type: none"> <li>• Adaptive Regulators</li> <li>• Maladaptive Regulators</li> <li>• “Active” Regulators (frequent strategy use with low suppression)</li> <li>• “Detached” Regulators (frequent strategy use with high suppression)</li> </ul>	<ul style="list-style-type: none"> <li>• PTSD (PCL-C)</li> <li>• Trauma History (THQ)</li> </ul>
	De France & Hollenstein (2017)	<ul style="list-style-type: none"> <li>• 1582 Undergraduates (Study 1)</li> <li>• 100 Undergraduates (Study 2)</li> </ul>	<ul style="list-style-type: none"> <li>• Trait Distraction (RESS)</li> <li>• Trait Rumination (RESS)</li> <li>• Expressive Suppression (RESS)</li> <li>• Reappraisal (RESS)</li> <li>• Expressive Engagement (RESS)</li> <li>• Arousal Control (RESS)</li> </ul>	Latent Profile Analysis (Studies 1 and 2)	<p>Study 1</p> <ul style="list-style-type: none"> <li>• Average Regulators</li> <li>• Suppression Propensity</li> <li>• Engagement Propensity</li> </ul> <p>Study 2</p> <ul style="list-style-type: none"> <li>• Average Regulators</li> <li>• Suppression Propensity</li> <li>• Engagement Propensity</li> <li>• Multi-Strategy Regulators<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Anxiety (BAI)</li> <li>• Depression (BDI)</li> <li>• Social Anxiety (LSAS-SR)</li> <li>• Relationship Quality (IPPA)</li> </ul>
	Chesney, Timmer-Murillo, & Gordon (2019)	<ul style="list-style-type: none"> <li>• 176 Undergraduates (Study 1)</li> <li>• 147 Undergraduates (Study 2)</li> </ul>	<ul style="list-style-type: none"> <li>• Trait Acceptance (DERS)</li> <li>• Trait Reappraisal (ERQ)</li> <li>• Trait Expressive Suppression (ERQ)</li> <li>• Trait Avoidance (CRI)</li> </ul>	Latent Profile Analysis (Studies 1 and 2)	<p>Study 1</p> <ul style="list-style-type: none"> <li>• Adaptive Regulators</li> <li>• Maladaptive Regulators</li> <li>• Acceptance Propensity (with Suppression)</li> <li>• Non-Acceptance Propensity</li> </ul> <p>Study 2</p>	<ul style="list-style-type: none"> <li>• Depression (BDI)</li> <li>• Anxiety (BAI)</li> </ul>

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| <ul style="list-style-type: none"> <li>• Trait Problem Solving (CRI)</li> <li>• Trait Rumination (CERQ)</li> </ul> | <ul style="list-style-type: none"> <li>• Adaptive Regulators</li> <li>• Maladaptive Regulators</li> <li>• Acceptance Propensity (without Suppression)</li> <li>• Nonacceptance Propensity</li> <li>• High Regulators</li> <li>• Low Regulators</li> </ul> |
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*Notes.* The “Low” Regulator group – while reporting the lowest levels of reappraisal – actually reported the second highest use of suppression (only behind the High Regulator group) and may therefore be better construed as Maladaptive Regulators (i.e., Low Reappraisal/Moderate-to-High Suppression)<sup>1</sup>. Akin to Adaptive Regulators<sup>2</sup>. Akin to Low Regulators<sup>3</sup>.

**Table 2. Total Traumatic Event Endorsement, Lifetime Exposure, and PTSD Symptom Severity Reported by Trauma Status and Collapsed Across the Entire Sample.**

	Criterion A Worst ( <i>n</i> = 234; 62.9%)	Criterion A Secondary ( <i>n</i> = 138; 37.1%)	Total ( <i>N</i> = 372; 100 %)
<i>Demographics (n, % of sample)</i>			
Age	19.60 (1.85)	18.96 (1.57)	19.36 (1.85)
Gender (Female)	194 (82.9)	116 (84.1)	310 (83.3)
Race/Ethnicity			
White	135 (57.7)	64 (46.4)	199 (53.5)
Black	66 (28.2)	42 (30.4)	108 (29.0)
Latinx	31 (13.2)	32 (23.2)	63 (16.9)
Asian	4 (1.7)	8 (5.8)	12 (3.2)
Native American	6 (2.6)	4 (2.9)	10 (2.7)
Biracial	11 (4.7)	6 (4.3)	17 (4.6)
Other	2 (0.9)	4 (2.9)	6 (1.6)
<i>Event Type (n, % of sample)</i>			
Natural disaster	66 (28.2)	35 (25.4)	101 (27.2)
Fire or explosion	46 (19.7)	23 (16.7)	69 (18.5)
Transportation accident	145 (62.0)	73 (52.9)	218 (58.6)
Other serious accident	28 (12.0)	8 (5.8)	36 (9.7)
Exposure to toxic substance	7 (3.0)	3 (2.2)	10 (2.7)
Physical assault	50 (21.4)	14 (10.1)	64 (17.2)
Assault with weapon	28 (12.0)	12 (8.7)	40 (10.8)
Sexual assault	86 (36.8)	29 (21.0)	115 (30.9)
Other sexual experience	51 (21.8)	14 (10.1)	65 (17.5)
Combat exposure	10 (4.3)	3 (2.2)	13 (3.5)
Captivity	4 (1.7)	2 (1.4)	6 (1.6)
Life-threatening illness or injury	7 (3.0)	1 (0.7)	8 (2.2)
Severe human suffering	4 (1.7)	-	4 (1.1)
Sudden violent death	51 (21.8)	14 (10.1)	65 (17.5)
Sudden accidental death	40 (17.1)	8 (5.8)	48 (12.9)
Serious harm caused by participant	2 (0.9)	1 (0.7)	3 (0.8)
Other stressful event	18 (7.7)	2 (1.4)	20 (5.4)
<i>Total Trauma Exposure and PTSD (M, SD)</i>			
# lifetime traumatic events	2.75 (1.85)	1.75 (0.99)	2.38 (1.66)
PTSD symptom severity	21.05 (18.04)	20.00 (16.87)	20.66 (17.60)

*Note.* Participants were allowed to select multiple categories for their race/ethnicity. Trauma exposure percentages do not add to 100 because participants were able to endorse more than one type of traumatic event. Exposure percentages in each column were computed as a function of group membership (e.g., 19.7% of those who reported a worst trauma that met for *DSM-5* definition of Criterion A trauma exposure experienced



a fire or explosion). “Criterion A Worst” = those whose index (“worst”) trauma met for Criterion A trauma exposure. “Criterion A Secondary” = those whose index trauma did not meet Criterion A, but reported at least one other traumatic event that did meet Criterion A.

**Table 3. Descriptive Statistics for Study Variables.**

Variable	Mean	SD	Range	Skewness	Kurtosis
PTSD Symptoms	20.66	17.60	0-73	1.06	.25
Attention to Emotion	38.31	6.71	18-50	-1.12	2.67
Emotional Clarity	43.65	11.00	10-65	-.30	.03
Thought Suppression	54.11	10.63	22-75	-.67	.64
Worry	55.15	14.60	19-80	-.27	-.84
Brooding	11.28	4.10	5-20	.32	-.85
Reflection	9.95	3.76	5-20	.59	-.43
Behavioral Avoidance	39.97	9.55	12-66	-.07	.28
Experiential Avoidance	49.21	11.66	13-78	-.23	.45
Cognitive Reappraisal	29.85	6.34	10-42	-.39	.29
Expressive Suppression	15.66	5.18	4-28	-.07	-.47
Acceptance	27.02	7.84	19-75	-.03	-.42
Social Support Seeking	9.92	3.57	4-16	.11	-1.02
Self-Medication	5.43	2.61	4-14	2.15	4.12
Negative Affect	21.63	7.88	10-45	.67	-.27

**Table 4. Zero-Order Correlations Among PTSD Symptoms, Emotion Regulation Strategies, and Emotional Awareness Variables.**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. PTSD Sym	-														
2. Attention	-.07	-													
3. Clarity	-.37*	.34*	-												
4. Tht Supp	.51*	.06	-.48*	-											
5. Worry	.41*	.17**	-.40*	.57*	-										
6. Brooding	.54*	.04	-.44*	.60*	.55*	-									
7. Reflection	.44*	.14**	-.35*	.52*	.45*	.68*	-								
8. Beh Av	.21*	-.02	-.21*	.31*	.32*	.26*	.17**	-							
9. Exp Av	.30*	-.04	-.26*	.40*	.36*	.43*	.28*	.60*	-						
10. Cog Reap	-.19*	.18*	.30*	-.09	-.27*	-.23*	-.13***	-.00	-.05	-					
11. Exp Sup	.21*	-.36*	-.28*	.25*	.10	.19*	.13***	.23*	.19*	-.04	-				
12. Accept	-.49*	-.03	.49*	-.67*	-.52*	-.67*	-.51*	-.23*	-.38*	.23*	-.19*	-			
13. Social SS	-.17**	.31*	.26*	-.15*	-.01	-.14**	-.10	-.11***	-.10	.16**	-.62*	.14**	-		
14. Self-Med	.23*	-.02	-.23*	.22*	.12***	.20*	.22*	.01	.13**	-.14**	.04	-.19*	-.07	-	
15. Neg Affect	.62*	.03	-.44*	.51*	.59*	.62*	.54*	.22*	.33*	-.24*	.16**	-.59*	-.16**	.22*	-

*Note.* ThtSup = Thought Suppression, Beh Av = Behavioral Avoidance and Exp Av = Experiential Avoidance, Cog Reap = Cognitive Reappraisal, Exp Sup = Expressive Suppression, Accept = Acceptance, Social SS = Social Support Seeking and Self-Med = Self-Medication.

\*  $p < .000$ , \*\*  $p < .01$ , \*\*\*  $p < .05$ .

**Table 5. Model Fit Indices for LPAs of Emotion Regulation Repertoires.**

Profiles of ER Repertoires	AIC	BIC	ABIC	Entropy	LRT ( <i>p</i> value)
2 Profile Solution	25854.17	25987.41	25879.54	.83	702.91 (<.000)
<b>3 Profile Solution</b>	<b>25595.50</b>	<b>25775.77</b>	<b>25629.82</b>	<b>.85</b>	<b>278.75 (.03)</b>
4 Profile Solution	25474.02	25702.32	25518.30	.87	142.47 (.12)
5 Profile Solution	25367.96	25642.29	25420.20	.89	129.24 (.11)

**Table 6. Unstandardized Means and Standard Errors for the 3-Profile Solution of Emotion Regulation Repertoires.**

ER Indicator	Adaptive Regulators n = 103 (27.7%)	Average Regulators n = 190 (51.1%)	Maladaptive Regulators n = 79 (21.2%)
Tht Supp	42.42 (1.58)	56.90 (.67)	62.86 (1.94)
Worry	41.98 (1.77)	57.15 (1.27)	67.54 (2.05)
Brooding	7.00 (.31)	11.26 (.57)	16.88 (.42)
Reflection	6.71 (.25)	9.88 (.40)	14.32 (.71)
Beh Av	35.89 (1.13)	40.29 (.85)	44.50 (1.29)
Exp Av	42.57 (1.32)	48.93 (1.08)	58.54 (1.64)
Cog Reap	31.40 (.56)	30.15 (.52)	27.09 (.97)
Exp Sup	14.12 (.56)	15.68 (.43)	17.61 (.83)
Accept	34.93 (.73)	26.00 (.75)	19.06 (1.44)
Social SS	10.47 (.39)	10.11 (.28)	8.79 (.58)
Self-Med	4.82 (.20)	5.31 (.19)	6.48 (.55)

**Table 7. Chi-Square Analyses Testing Differences in Mean Levels of Distal Outcomes by Emotion Regulation Repertoire Profile Membership.**

	Adaptive	Average	Maladaptive
PTSD Symptoms	8.50 <sup>a</sup> (.81)	19.45 <sup>b</sup> (1.01)	38.88 <sup>c</sup> (2.15)
Attention to Emotion	37.43 <sup>a</sup> (.70)	38.76 <sup>a</sup> (.48)	38.45 <sup>a</sup> (.75)
Emotional Clarity	51.18 <sup>a</sup> (.83)	42.97 <sup>b</sup> (.69)	34.28 <sup>c</sup> (1.20)

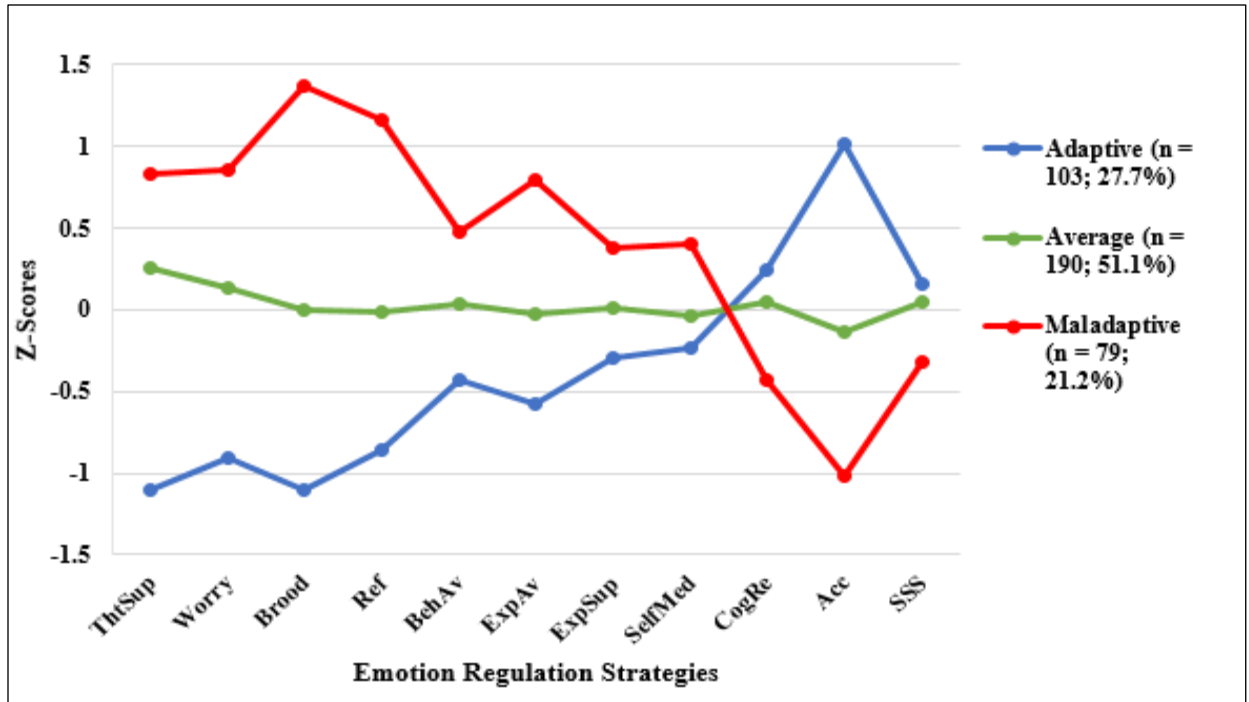
*Note.* Means with different superscripts within a row at significantly different at  $p < .001$ .

**Table 8. Simple Linear Regression Analyses Testing the Dummy-Coded Emotion Regulation Profile Membership Variable Predicting Distal Outcomes Before and After Adjusting for Negative Affect.**

Criterion	Predictor	B	SE B	$\beta$	<i>p</i> -value	<i>R</i> <sup>2</sup>
<i>Models Unadjusted for Negative Affect</i>						
PTSD	Constant	19.56	1.08	1.11	<.000	.28
	Adaptive Reg	-9.31	1.83	-.24	<.000	
	Maladaptive Reg	17.20	2.00	.40	<.000	
Attention to Emotion	Constant	38.43	.50	5.74	<.000	.00
	Adaptive Reg	-.67	.82	-.05	.413	
	Maladaptive Reg	.31	.91	.02	.734	
Emotional Clarity	Constant	42.82	.71	3.90	<.000	.24
	Adaptive Reg	8.19	1.18	.34	<.000	
	Maladaptive Reg	-6.98	1.30	-.26	<.000	
<i>Models Adjusted for Negative Affect</i>						
PTSD	Constant	-3.24	2.67	-.18	.231	.41
	Negative Affect	1.07	.12	.48	<.000	
	Adaptive Reg	-3.16	1.80	-.08	.080	
	Maladaptive Reg	7.89	2.07	.18	<.000	
Attention to Emotion	Constant	38.56	1.34	5.76	<.000	.00
	Negative Affect	-.01	.06	-.01	.916	
	Adaptive Reg	-.71	.89	-.05	.425	
	Maladaptive Reg	.36	1.04	.02	.728	
Emotional Clarity	Constant	49.64	1.88	4.52	<.000	.27
	Negative Affect	-.32	.08	-.23	<.000	
	Adaptive Reg	6.34	1.25	.26	<.000	
	Maladaptive Reg	-4.21	1.46	-.16	.004	

*Note.* The Average Regulator profile is the reference group in all analyses.

**Figure 1. Standardized Scores for Emotion Regulation Repertoires.**



*Note.* ThtSup = Thought Suppression (White Bear Suppression Inventory), Worry (Penn State Worry Questionnaire), Brood = Brooding and Ref = Reflection (Ruminative Response Scale), BehAv = Behavioral Avoidance and ExpAv = Experiential Avoidance (Multidimensional Experiences of Avoidance Scale), Acc = Acceptance (Kentucky Inventory of Mindfulness Skills), SSS = Social Support Seeking and SelfMed = Self-Medication (COPE Inventory).