

Emotion Regulation Repertoire: Which Strategies Drive Mental Health?

by

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## ABSTRACT

Emotion regulation repertoire, or the number of emotion regulation strategies one is able to employ when needed, is an important element of emotion regulation flexibility. Emotion regulation flexibility, the ability to regulate in accordance with changing situational contexts and demands, is predictive of emotion regulation success. Currently, little is known about emotion regulation repertoire and its association with emotional health and well-being. In particular, more can be learned about how the different strategies in one's repertoire interact, and which strategies show stronger relationships with mental health. The current study aimed to assess the relationship of different emotion regulation strategies to mental health, including their individual and combined influence. In addition, the interaction between the use of specific emotion regulation strategies and emotion regulation flexibility with respect to mental health was examined. I hypothesized (1a) reappraisal and (1b) acceptance, two strategies previously associated with positive psychological outcomes, would be significant predictors of mental health, and (2) better flexibility would predict better mental health. In addition, I hypothesized that (3) strategies often found to be maladaptive (suppression, distraction, rumination, and experiential avoidance) would have an inverse relationship with mental health. Finally, (4) maladaptive strategies would be associated with worse mental health for those lower in flexibility. These hypotheses were tested through a questionnaire as part of a larger in-lab study. Results revealed that reappraisal and rumination were the strongest predictors of mental health. Emotion regulation flexibility did not predict mental health or moderate the relationship between individual emotion regulation strategies and mental health. Results from this study suggest some emotion regulation strategies are stronger predictors of mental health than others. This will guide future research on specific emotion regulation strategies in a repertoire as well as their combined effect on mental health. Creating a clearer picture of how different strategies interact and influence mental health will also be vital for clinical interventions.

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## CHAPTER 1

### INTRODUCTION

#### **Emotion Regulation**

Emotions are an integral part of our lives. They are how we express ourselves and experience the world with others. Emotions can be conscious or unconscious and derive from our circumstances, mood and social relationships. Emotion regulation is “an attempt to influence which emotions we have, when we have them, and how we experience/express them” (Gross, 2015, p. 5). Emotions unfold over time, from mere seconds to minutes. They begin with a psychologically relevant situation from an external or internal stimulus. Aspects of the situation or stimuli are attended to and appraised, at which point emotion regulation strategies already may be involved (Gross, 1998b). Emotions, and thus how we regulate them, affect nearly all interactions and aspects of our lives. Emotion regulation strategies and their associated costs and benefits have been studied extensively. These studies reveal that people are able to alter the intensity and duration of emotions, such as “down-regulating” or decreasing and “up-regulating” or enhancing emotions and can influence the experience and expression of emotions through various emotion regulation strategies (Gross, 2015). These strategies allow us to maintain composure, build interpersonal connections, and interact effectively and appropriately with those around us.

#### **Process Model of Emotion Regulation**

A common framework used to research emotion regulation strategies is the *process model of emotion regulation* (Gross, 1998b). According to the process model, there are five points during the emotion generative process in which emotions may be regulated: a) *situation selection*: taking steps in order to make it more or less likely one will encounter a particular emotional stimulus; b) *situation modification*: taking actions to alter a situation in order to change its emotional impact; c) *attentional deployment*: directing one’s attention in order to influence the emotional response; d) *cognitive change*: modifying one’s appraisal of the situation in order to alter its emotional impact; and e) *response modulation*: influencing certain components of the emotional response after the emotion is already developed (Gross, 1998b). Emotions may be

intensified or regulated at any of the five points, deliberately or implicitly. However, not every point will be attended to in every instance, and the process may be repeated at any point. In other words, each step is a potential, but not guaranteed, target for regulation (Gross, 2015).

Since the development of Gross' process model, research on emotion regulation has surged (Gross, 2015). Most early emotion regulation research examined deliberate, explicit regulation using a single strategy, or compared two strategies, in a controlled laboratory environment. Whether individuals can regulate as instructed (usually in response to a negative stimulus), and the short and long-term "costs and benefits" associated with each strategy, are then assessed. Two of the most commonly studied strategies are suppression and reappraisal (Gross & Levenson, 1993; Gross & John, 2003; Richards & Gross, 2000). Suppression is a response modulation strategy in which an individual inhibits emotional-expressive behavior (Gross & John, 2003). Suppression is often studied by instructing participants to regulate while watching an emotion-eliciting film clip (often sadness or disgust) or viewing emotional pictures. Participants are instructed to attempt to hide any distressing feelings as best as they can. In other words, participants are instructed to behave in such a way an onlooker would be unaware of any feelings they were experiencing (Gross, 1998a). On the other hand, reappraisal is a form of cognitive change, whereby an emotion-eliciting situation is re-framed or reconstructed in order to alter (typically decrease) its emotional impact (Gross & John, 2003). Reappraisal also is often studied by having participants watch an emotion-eliciting film clip or view emotional pictures. Participants are then instructed to think of the content objectively and neutrally, not in an emotionally relevant manner (Richards & Gross, 2000).

Early research on suppression and reappraisal have found suppression use is linked with reduced rapport and connection-building in social situations (Butler et al., 2003), while reappraisal is associated with better social functioning and well-being (Gross & John, 2003). Suppression has also been associated with impaired memory. Richards and Gross (1999) found that participants who suppressed their emotions during a social interaction had more impaired memory of that interaction than those who reappraised. Moreover, Richards and Gross (2000) found that participants who engaged in reappraisal during a memory task involving negative



emotion-eliciting slides performed better than those who suppressed their emotions. Although presumably this is due to reduced interference from the effort required to suppress emotions, it also could be due to elaboration of the material that may occur during reappraisal. Joormann and Gotlib (2010) found lower reappraisal use and higher suppression use to be linked with depression symptoms. Similarly, Kashdan and Rottenberg (2010) found that frequent unresponsive facial expression, resulting from suppression, inhibits social connections, which in turn may perpetuate depression. Finally, Lazarus and Alfert (1964) and Gross (1998) found individuals who reappraised their emotions during a negative emotion-eliciting task displayed fewer behavioral and psychological responses to the negative stimuli compared to those who were given no regulation instruction. Collectively, this research has led some researchers to argue that certain strategies are inherently adaptive (e.g., reappraisal) or maladaptive (e.g., suppression). However, it also can be argued that no single strategy is optimal in all situations, as discussed below (Richardson, 2017; Troy et al., 2013; Bonanno & Burton, 2013).

### **Acceptance**

Acceptance as an emotion regulation strategy gained popularity with the “third wave” of behavior therapies, including Dialectical Behavior Therapy, Acceptance and Commitment Therapy, and the “mindfulness” components of each (Veehof, et al., 2016). The impetus for use of acceptance, instead of, or in addition to, reappraisal (which is a central component of cognitive behavioral therapy) is, in part, the challenge of reappraising at higher levels of emotional intensity (Sheppes, Scheibe, Suri, & Gross, 2011; Birk & Bonanno, 2016). For example, in dialectical behavior therapy, the use of strategies such as distraction and acceptance are encouraged because they can be implemented immediately and in nearly any context. In addition, acceptance has been found to be less difficult to deploy than reappraisal (Troy, Shallcross, Brunner, Friedman & Jones, 2018). As a longer-term strategy, a willingness to accept feelings presumably can prevent unhealthy behaviors such as consuming alcohol, binge eating, or cutting – which are considered emotional avoidance or emotion-focused coping behaviors. Despite a large clinical literature on the effects of acceptance in the context of mental health treatment, relatively fewer studies have directly compared acceptance with other emotion regulation strategies in emotion

research paradigms. Thus, it could be expected that acceptance would serve as a useful emotion regulation strategy, even above and beyond reappraisal.

### **Context**

Considering strategies as either maladaptive or adaptive has merit but may not capture the more complex, nuanced manner in which people regulate emotions in daily life. For example, people tend to use more than one strategy at any given moment. Opitz, Cavanagh and Urry (2015) found that when participants were instructed to reappraise in response to high-intensity negative photographs, a significant portion also endorsed using uninstructed strategies in addition to reappraisal. Additionally, much research has aimed to elicit a single emotion. However, individuals tend to experience more than one emotion at a time; these emotions, and their intensity, are constantly in flux and often influenced by social contexts (Campos, Walle, Dhal, & Main, 2011).

For example, reappraisal has been found to be more effective than distraction when the emotional stimulus is relatively low in intensity, however distraction is more effective when the intensity is relatively high (Sheppes, Scheibe, Suri, & Gross, 2011; Sheppes, et al., 2014). Additionally, reappraisal can be adaptive when dealing with uncontrollable stressors, but maladaptive when dealing with controllable stressors (Troy et al., 2013). In fact, in participants with high levels of controllable stress, more frequent use of reappraisal was associated with higher levels of depression (Troy et al., 2013). The positive association between reappraisal and depression contradicts the majority of reappraisal research, which suggests it is linked with better psychological health. The authors suggest that at times, negative emotions motivate people to take action. Therefore, if an individual over-relies on reappraisal, particularly in situations that could be controlled by taking corrective action, their depressive symptoms may increase because the negative situation does not improve (Troy et al., 2013).

Suppression has been found to be utilized more effectively in social contexts than individual contexts, especially in interactions with non-close partners (ex. wanting to keep up appearances with a co-worker, acquaintance) as well as in low-stress contexts (English, Lee, John, & Gross, 2017; Richardson, 2017). In a meta-analysis, suppressing the expression of

emotion was more effective in reducing emotional arousal than suppressing thoughts or the experience of emotions (Webb et al., 2012). In addition, suppression is found to be more commonly utilized and effective in response to sadness, as compared to anger (Dixon-Gordon, Aldao & De Los Reyes, 2015).

While people tend to down-regulate negative emotions, in certain contexts increasing negative emotions is more beneficial. When anticipating confrontational tasks, participants prefer to increase anger, rather than decrease it, and this is found to be effective in reaching their goals (Tamir, Mitchell, & Gross, 2008). As research on context grows, a common theme has emerged: being well-regulated depends largely on one's ability to *flexibly* regulate in accordance with the context and demands on various situations (Westphal, Seivert, & Bonanno, 2010).

### **Emotion Regulation Flexibility**

Emotion regulation flexibility refers to “the ability to implement emotion regulation strategies that are synchronized with contextual demands” (Aldao, Sheppes, & Gross, 2015, p.2). In other words, emotion regulation flexibility reflects the ability to match emotion regulation strategies to a changing environment. Bonanno et al. (2004) found that individual ability to flexibly enhance or suppress emotional expression over time in an expressive-regulation task – in which participants were told to either enhance their emotional expression, suppress emotional expression, or act naturally - predicted better self-reported adjustment in New York City college students over a two-year period in the aftermath of the September 11<sup>th</sup>, 2001 attacks. Westphal, Seivert and Bonanno (2010) replicated and extended these findings by measuring flexibility in a modified version of the Bonanno et al. (2004) paradigm. By assessing the same participants three years later, Westphal and colleagues demonstrated stability of flexibility and bolstered measurement of adjustment levels by interviewing close friends instead of only relying on self-report. Additionally, Birk and Bonanno (2016) found those more flexible in response to internal feedback were more likely to switch from a non-optimal to optimal strategy as the negative intensity of photographs increased. Flexibility in these individuals also was associated with higher well-being and life satisfaction. While research on emotion regulation flexibility is still growing, two models (Gross's [2015] extended process model and Bonanno & Burton's [2013] regulatory

flexibility model, as described below) have emerged that attempt to break down the elements influencing flexibility, and in turn address the question of why some individuals can effectively regulate their emotions while others cannot.

### **Extended Process Model of Emotion Regulation**

Gross (2015) built upon his process model with the *extended process model of emotion regulation*, which attempts to disentangle individual differences in emotion regulation ability and flexibility in three stages of emotion regulation. As with the process model, each step in the extended process model is a key point for potential success or failure in regulation.

1) *Identification*: validation that there is a need to regulate. An important component of identification is emotional awareness, or interoceptive awareness. Füstös, Gramann, Herbert, & Pollatos (2013) found interoceptive awareness facilitated more successful emotion regulation. Similarly, Kever, Pollatos, Vermeulen & Gynberg (2015) found that individuals with higher interoceptive sensitivity, which the authors defined as the ability to perceive bodily signals, had greater use of both reappraisal and suppression. On the other hand, psychopathology, which is highly associated with rigidity in emotion regulation strategy choice, may distort evaluation of the situation (Gross, 2015).

2) *Selection*: in which a particular strategy is chosen. This may be done consciously and voluntary or unconsciously and automatically. Here, the individual evaluates which strategy would be best, based on factors such as available cognitive resources and the type or intensity of emotion (Gross, 2015). An important component of the selection stage is one's repertoire size, or the number of strategies one can employ at any given moment. Repertoire is the focus of this study and will be examined in further detail below.

3) *Implementation*: carrying out the chosen strategy. Here an individual takes the strategy chosen and implements it in an appropriate manner for that particular situation (Gross, 2015). Two important components of the implementation stage are the individual's ability to properly execute the chosen strategy, and to properly evaluate the strategy's effectiveness (e.g., to determine whether a new strategy needs to be chosen).

## Regulatory Flexibility

Bonanno and Burton (2013) developed an individual differences framework for assessing emotion regulation and coping. They argue that there are individual differences in regulatory flexibility, in which such variables as context, time and choice affect which strategies will work, when, and for whom (Bonanno & Burton, 2013). Their *regulatory flexibility model*, like Gross' extended process model, has three sequential steps in the emotion regulation process: context sensitivity, repertoire, and responsiveness to feedback. 1) *Context sensitivity* involves evaluating the cost and benefits of various emotion regulation strategies in order to choose the most appropriate one. This evaluation is affected by mood, social factors, and goals. 2) *Repertoire*, or the number of strategies you have to choose from, is influenced by individual differences in ability to utilize various emotion regulation strategies and thus influences which strategy is chosen. 3) *Responsiveness to feedback* involves monitoring the effectiveness of the chosen strategy, as well as monitoring the changing situation, and adjusting as needed (Bonanno & Burton, 2013).

The extended process model (Gross, 2015) and the regulatory flexibility model (Bonanno & Burton, 2013) merge together nicely, allowing us to disentangle why some individuals are able to successfully regulate their emotions while others cannot. The first component (*identification* [Gross, 2015], or *context sensitivity* [Bonanno & Burton, 2013]) depends on internal and external factors such as emotional awareness, psychopathology, goals, and social influences. The second component (*selection* [Gross, 2015], or *repertoire* [Bonanno & Burton, 2013]) depends on one's ability to utilize emotion regulation strategies. Finally, the third component (*implementation* [Gross, 2015], or *responsiveness* [Bonanno & Burton, 2013]) relies on proper evaluation of the effectiveness of the chosen strategy.

Both Gross (2015) and Bonanno and Burton (2013) argue that to successfully navigate through emotional situations, one must be flexible in expression and regulation of emotions. Related, recent research on coping has suggested that successful adaptation depends not so much on the strategy chosen, but on one's ability to flexibly apply the strategy (e.g., up and down regulate, stop, switch; Cheng, 2001), and that those who are more flexible cope better than those

who are not (Levy-Gigi, et al., 2015). An important factor in individuals' flexibility is how many strategies they can choose from, or the size of their emotion regulation repertoire.

### **Emotion Regulation Repertoire**

The individual differences in emotion regulation strategies chosen imply that some individuals may have more, or different strategies available to them than others. An emotion regulation repertoire is essentially an emotional toolbox, comprised of various strategies one may employ when necessary. There has been little research on what type of repertoire is best for successful regulation and overall well-being, and that research has been inconsistent. Orcutt, Bonanno, Hannah, and Miron (2014) found students with access to a greater number of emotion regulation strategies evidenced less traumatic stress after a school shooting. Loughheed and Hollenstein (2012) found that low use of all measured strategies (reappraisal, suppression, concealing, adjusting, and emotional engagement) was associated with higher levels of psychopathology. On the other hand, Dixon-Gordon, et al. (2014) found individuals who endorsed high use of all measured strategies (acceptance, cognitive reappraisal, problem solving, experiential avoidance, expressive suppression, self-criticism, and worry/rumination) exhibited greater levels of psychopathology when recalling six distressing situations. However, and critically, individuals who had relatively higher use of adaptive strategies (acceptance, reappraisal, and problem solving) endorsed lower levels of psychopathology, suggesting that successful regulation and well-being may depend not only on how large an individual's repertoire is, but also on the specific strategies included.

There are differences in the above studies that warrant mention, as they may have contributed to the different results. First, there were differences in age and context of the samples studied. For example, Loughheed and Hollenstein (2012) examined emotion regulation in a community sample of adolescents, who averaged 13 to 14 years old. Orcutt et al., (2014) examined emotion regulation longitudinally (over two years) among college-age women (20 years old on average), following a university shooting. Dixon-Gordon, et al. (2014) also examined emotion regulation among undergraduate students (approximately 19 years old on average), but cross-sectionally and not in response to a school-wide event. Emotion regulation tends to evolve

and become more stable as we age, thus these studies look at distinctly unique populations. It appears, as we age, a large repertoire with more reliance on adaptive strategies and less on maladaptive strategies is advantageous.

Second, in the studies reviewed above, there was variation in the conceptualization of repertoire size and the number of strategies assessed. Loughheed and Hollenstein (2012) had participants fill out questionnaires relating to reappraisal and suppression use, concealing and adjusting use and emotional engagement. Similarly, Orcutt et al. (2014) assessed repertoire through a questionnaire on experiential avoidance, clarity of emotional responses, nonacceptance of emotional responses, and limited access to emotion regulation strategies perceived as effective. On the other hand, Dixon-Gordon, et al. (2014) had participants recall six emotion-eliciting situations where they experienced moderate to high levels of anxiety, sadness and anger. Participants rated the extent to which they used emotion regulation and coping strategies (acceptance, cognitive reappraisal, problem solving, experiential avoidance, expressive suppression, self-criticism, and worry/rumination) to regulate their emotions in each situation. Evaluating emotion regulation use in these distinct manners create unique conceptualizations of emotion regulation use. Dixon-Gordon, et al. (2014) created a more context-specific questionnaire while Loughheed and Hollenstein (2012) and Orcutt, et al. (2014) used a more trait-based questionnaire and assessed fewer specific emotion regulation strategies. Different scales and types of emotion regulation strategies are not always compatible with each other.

### **Interactive Relationship of Emotion Regulation Strategies**

Aldao and Nolen-Hoeksema (2010) examined which emotion regulation strategies played a stronger role in psychopathology. They examined the relationship between four emotion regulation strategies: rumination, suppression, reappraisal, and problem-solving and symptoms of psychopathology: depression, anxiety, and eating disorders. Suppression and rumination, the two presumed maladaptive strategies measured, were more strongly associated with all three symptoms of psychopathology than reappraisal and problem-solving, the two presumed adaptive strategies measured. Aldao and Nolen-Hoeksema (2010) argue that use of maladaptive

strategies plays a more important role in predicting psychopathology than does non-use of adaptive strategies.

Aldao and Nolen-Hoeksema (2012) built upon this finding to further investigate the interactive relationship between adaptive and maladaptive emotion regulation strategies in the prediction of psychopathology. Through a longitudinal (1-year) interview study, they examined use of rumination, acceptance, positive reframing, behavioral disengagement, denial, and suppression as well as symptoms of depression, anxiety, and alcohol-related problems. Aldao and Nolen-Hoeksema (2012) found use of maladaptive strategies (rumination, suppression, behavioral disengagement, denial) moderated the relationship between use of adaptive strategies and psychopathology symptoms. In particular, adaptive strategies had a negative relationship with psychopathology only at high levels of maladaptive strategy use. The authors conclude that this suggests the effectiveness of strategies may depend on the other strategies in one's repertoire. In other words, adaptive strategies may be more important for individuals with a large repertoire that also includes maladaptive strategies.

### **Current Study**

In the present study, I aim to assess the relationship of different emotion regulation strategies to mental health, including their individual and combined influence. In addition, I aim to assess the interaction between the use of specific emotion regulation strategies and emotion regulation flexibility with respect to mental health.

I hypothesize (1a) reappraisal and (1b) acceptance, two strategies previously associated with positive psychological outcomes, will be significant predictors of mental health, and (2) better flexibility will predict better mental health. In addition, (3) strategies often found to be maladaptive (suppression, distraction, rumination, and experiential avoidance) will have an inverse relationship with mental health. Finally, (4) maladaptive strategies will be associated with worse mental health for those lower in flexibility. In other words, with greater emotion regulation flexibility, maladaptive strategies will be less detrimental to overall mental health.



## CHAPTER 2

### METHODS

#### **Participants**

Participants completed an online survey through Arizona State University's online research participation credit system (SONA). A total of 178 university students participated in this questionnaire. They were recruited through SONA as part of a larger, in-lab study. The study was advertised as a "Game Playing Study" in which participants would play a decision game while physiological measures were collected. Of the 178 participants, 64.6% (N=115) were female, 44.9% were White/Caucasian and 30.3% were Hispanic/Latino. Ages ranged from 18-39, with 79.8% between 18 and 22 years old.

#### **Procedure**

After signing up for a time slot through the research participation software, participants filled out a pre-lab questionnaire online, hosted through Qualtrics.com. The questionnaire took approximately 45 minutes and included the measures relevant to the present study. During a subsequent laboratory portion of the experiment not relevant to the present study, participants completed behavioral tasks and completed an additional in-lab questionnaire. The laboratory session took approximately 1.5 hours. Participants were compensated with six research credits or \$20 for their time, and also received an additional \$20 as part of the behavioral tasks. The study was approved through Arizona State University's institutional review board. Participants provided consent prior to beginning the questionnaire.

#### **Measures**

**Suppression and Reappraisal.** Suppression and reappraisal were measured with the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). The ERQ is a 10-item scale which assesses participants' tendency to regulate their emotions with cognitive reappraisal (six items) and expressive suppression (four items) on a 7-point Likert scale from 1 = strongly disagree, to 7 = strongly agree. Higher scores indicate more frequent use. Sample items include: 'When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay

calm,' and 'When I am feeling negative emotions, I make sure not to express them.' In our sample there was high internal consistency for both suppression ( $\alpha = .74$ ) and reappraisal ( $\alpha = .80$ ).

**Distraction.** Distraction was measured with the distraction subscale of the Thought Control Questionnaire (TCQ; Wells & Davies, 1994). The six-item distraction subscale assesses how participants generally control their thoughts on a 4-point Likert scale from 1 = never, to 4 = almost always, with a higher score indicating more frequent use. A sample item is, 'When I experience an unpleasant/unwanted thought, I occupy myself with work instead.' In our sample there was high internal consistency for this measure ( $\alpha = .78$ ).

**Rumination.** Rumination was measured with the Sadness and Anger Rumination Inventory (SARI; Peled & Moretti, 2010). The SARI is a 19-item, Likert-scaled measure. For the sake of this study, the top four items, based on factor loadings from Peled and Moretti (2010), of both the sadness and anger rumination subscales (8 items total) were used. The scale assesses how often participants use each item when they are angry or sad on a 5-point Likert scale from 1 = never, to 5 = always, with a higher score indicating more frequent use. A sample item is, 'I get absorbed in thinking about why I am sad and find it difficult to think about other things.' There was high internal consistency in our sample for this measure across the sadness and anger items ( $\alpha = .92$ ).

**Acceptance.** Acceptance was measured with acceptance scales by Wolgast (2014). The scale was constructed to directly assess acceptance/nonacceptance and used items from the Acceptance and Action Questionnaire – II (Bond, et al., 2011) as reference. The seven-item scale assesses how true each statement is for participants on a 7-point Likert scale from 1 = never true, to 7 = always true, with a higher score indicating more frequent use. A sample item is, 'I let my thoughts and feelings come and go, without trying to control or avoid them.' There was low internal consistency for these 7 items in our sample ( $\alpha = .60$ ). After eliminating four items (1, 4, 5, and 6), the remaining 3 items (2, 3, and 7) showed improved internal consistency ( $\alpha = .72$ ).

**Experiential Avoidance.** Experiential avoidance was measured with the Brief Experiential Avoidance Questionnaire (BEAQ; Gamez et al., 2014). The BEAQ is a 15-item questionnaire, which assesses how true each statement is for participants on a 6-point Likert

scale from 1= strongly disagree, to 6 = strongly agree. Higher scores indicate greater agreement with the item. A sample item is, 'The key to a good life is never feeling any pain.' In our sample there was high internal consistency for this measure ( $\alpha = .82$ ).

**Emotion regulation flexibility.** Emotion regulation flexibility was assessed with the Flexible Regulation of Emotional Expression (FREE) Scale (Burton & Bonanno, 2016). The FREE scale is a 16-item scale used to assess participants' ability to enhance and suppress emotional expression on a 6-point Likert scale from 1 = unable, to 6 = very able, with a higher score indicating more flexibility. A sample item is, 'Indicate how well would you be able to be even more expressive than usual of how you are feeling: A friend wins an award for a sport that doesn't interest you.' There was high internal consistency for this measure ( $\alpha = .80$ ).

**Mental health.** Mental health was assessed with the Mental Health Inventory (MHI-5) (Berwick, et al., 1991). The MHI-5 is a five-item scale used to assess anxiety and affective disorders (e.g., major depressive disorder) in the last month on a 6-point Likert scale from 1 = none of the time, to 6 = all of the time. Items were scored so that a higher score indicated less anxiety and depression. A sample item is, 'How much of the time, during that last month, have you: been a very nervous person? [reverse-scored] Been a happy person?' In our sample, there was high internal consistency for this measure ( $\alpha = .80$ ).

### **Data Analysis**

To test the hypotheses stated above, we ran a hierarchical regression in SPSS. A five-step hierarchical regression was conducted with Mental Health as the dependent variable. To test Hypotheses 1a and 1b, that reappraisal and acceptance each would predict mental health, reappraisal was entered at step one and acceptance was entered at step two. Reappraisal and acceptance were not entered simultaneously, as reappraisal and acceptance each may be useful in different contexts. Reappraisal was entered into the model first, given that the benefits of reappraisal are established in the emotion regulation research literature, and acceptance gained popularity relatively more recently.

Flexibility, as assessed by the FREE scale, was entered on step three in order to test hypothesis two, that greater flexibility would predict greater mental health. The four maladaptive

strategies -- suppression, distraction, rumination and experiential avoidance -- were entered simultaneously at step four to test hypothesis three. These were entered together to examine the overall effect of presumed maladaptive strategies on mental health, and because we did not have any a priori hypotheses regarding the relative influence of each strategy on mental health. Finally, to test hypothesis four that flexibility would interact with the maladaptive strategies in predicting mental health, interaction terms between each of the maladaptive strategies and emotion regulation flexibility were entered at step five. All variables were mean-centered prior to computing each interaction term.

## CHAPTER 3

### RESULTS

#### **Descriptive Results**

Means and standard deviations for each of the emotion regulation measures, emotion regulation flexibility, and mental health are displayed in Table 1. Correlations among measures are in Table 2.

#### **Hypothesis Testing**

Unstandardized and standardized coefficients,  $R^2$  values, and change in  $R^2$  for the hierarchical linear regression predicting mental health from emotion regulation strategies, emotion regulation flexibility, and their interaction are shown in Table 3. At step one, reappraisal contributed significantly to the regression model and accounted for 17.4% of the variance in mental health. This supports hypothesis 1a that greater reappraisal is a significant predictor of better mental health. Adding acceptance to the regression model explained an additional 4.1% of the variance in mental health and this change in  $R^2$  was also significant. Contrary to Hypothesis 1b, however, acceptance showed an inverse relationship with mental health. On step 3, adding emotion regulation flexibility to the model only explained an additional 0.7% of the variance in mental health, and this change in  $R^2$  was not significant. Thus, our second hypothesis that greater flexibility would be associated with better mental health was not supported. Adding suppression, distraction, rumination and experiential avoidance to the model simultaneously at step 4 explained an additional 21.2% of the variance in mental health, with greater use of these strategies associated with worse mental health, and this change in  $R^2$  was also significant. Thus, our third hypothesis was supported. However, rumination was the only significant individual predictor, and it showed an inverse relationship with mental health. Suppression, experiential avoidance, and distraction did not predict mental health (coefficients were in the direction of an inverse relationship with mental health for suppression and experiential avoidance, and a zero relationship with mental health for distraction). Finally, adding the interaction terms reflecting the interaction between each maladaptive strategy and emotion regulation flexibility on step 5 only

explained an additional 0.8% of the variance in mental health, and this change in  $R^2$  was not significant. Thus, our fourth hypothesis was not supported.

## CHAPTER 4

### DISCUSSION

It was hypothesized that reappraisal, acceptance, and emotion regulation flexibility would be significant positive predictors of mental health, and suppression, distraction, rumination and experiential avoidance would have an inverse relationship with mental health, which would be moderated by flexibility. The results of the study supported the hypothesis that greater use of reappraisal was associated with better mental health. Contrary to our predictions, greater use of acceptance was associated with reports of worse mental health. Greater use of rumination, suppression, and experiential avoidance also were associated with worse mental health; however, when examined in a model that included all the emotion regulation strategies, rumination was the only strategy to predict worse mental health, with a trend for experiential avoidance. Finally, emotion regulation flexibility was not a significant predictor of mental health, nor did flexibility moderate the relationship between presumed maladaptive emotion regulation strategies and mental health.

#### **Reappraisal, Acceptance, and Mental Health**

Reappraisal was associated with better mental health, which is consistent with most reappraisal research, as described in the introduction. Surprisingly, acceptance predicted worse mental health. The hypothesis that acceptance would be associated with better mental health was based on a large and growing body of evidence suggesting that acceptance strategies, often taught as part of mindfulness-based therapies, are useful in treating clinical conditions, reducing stress, and improving well-being (Veehof, et al., 2016). However, in contrast with reappraisal, where individuals are actively altering the way they view and feel about a situation, in acceptance, individuals are actively accepting their feelings as they are. It is possible that frequent use of acceptance as an emotion regulation strategy is indicating that there are more uncontrollable negative situations and/or higher levels of negative feelings to accept in the first place, which in turn is associated with, and/or reflects, mental health difficulties. In our sample, reappraisal and acceptance were significantly inversely correlated (in addition to being correlated with mental health in opposite directions). Perhaps an individual who often reappraises emotions does not

often accept their emotions or have a need to do so. However, as mentioned in the introduction, reappraisal was found to be maladaptive when dealing with controllable stress. I would hypothesize acceptance would also be maladaptive when dealing with controllable stress, yet adaptive when dealing with uncontrollable stress just as reappraisal is. Further research is required to disentangle this relationship. Perhaps reappraisal and acceptance are adaptive in a similar manner, however different types of people utilize one over the other.

As described above, much of the acceptance literature examines acceptance as an aspect of different forms of therapy. An example of one such therapy is Acceptance and Commitment Therapy (ACT). ACT aims to enhance psychological flexibility, or the ability to act in a manner consistent with the environment (Hayes, et al., 2006). ACT aims to help people live more in the moment and less “in their head.” Further, acceptance is introduced as an active and mindful recognition of negative thoughts about one’s past without unnecessary attempts to change the thoughts. Further, individuals are taught to defuse these thoughts and alter how they interact and relate to them. Critically, individuals create concrete behavior change goals which they work through with a trained professional (Hayes, et al., 2006). This leads us to believe the scale utilized in this sample was only able to assess one important factor in acceptance. The scale, designed by Wolgast (2014), was constructed to assess acceptance/nonacceptance as a strategy or trait apart from the presence or absence of distress. In other words, while the acceptance questionnaire asked how individuals dealt with their emotions when feeling depressed, worried, or anxious, it did not assess how often they actually felt that way. Thus, it is possible that in our sample, greater acceptance was related to worse mental health because endorsement of greater acceptance of negative emotions was confounded with depressive symptoms.

In addition, although there was good internal consistency and validity for our acceptance measure in the original study, the scale has not been validated in the literature, and we had to omit items to achieve adequate reliability in our sample. Most research articles assess acceptance in the context of cognitive therapy, an experimental manipulation, or as a one-item scale. A better understanding of acceptance, emotion regulation, and mental health may benefit



from a context-specific scale that assesses the frequency and nature of potentially distressing events, as well as the extent of acceptance of feelings in response to those events. While at times it is valuable to accept emotions as they are, there are times where a more proactive approach, such as reappraisal, would be more effective. Further research and a more established scale of acceptance would be required to disentangle this relationship.

### **“Maladaptive” Strategies**

Although together the strategies initially considered as maladaptive predicted worse mental health, when examining each strategy individually while controlling for the others (i.e., in a hierarchical regression model), rumination was the only strategy to have a significant inverse relationship with mental health. The relationship between rumination and worse mental health, particularly greater depression, has been well established in the literature (Nolen-Hoeksema, 1991).

It is important to note there has been a debate on how to best operationalize rumination. The responses style theory (Nolen-Hoeksema, 1991) states that rumination is a passive and repetitive focus on the causes and consequences of one’s distress. The theory states that rumination does not lead to active problem solving and instead the individual remains fixated on their problems and feelings without taking action. This view of rumination solely focuses on the maladaptive consequences. However, Martin and Tesser (1996) argue rumination is instrumental and adaptive, as it leads to problem solving. Treynor, et al. (2003) categorized items from the Ruminative Responses Scale, a commonly used rumination questionnaire, as either depression-related, reflection or brooding. They found a more reflective type of rumination is associated with more depression in the short-term, but less depression in the long-term. I would be interested to further disentangle rumination in future studies. If the Rumination Response Scale was added to the questionnaire, in order to assess a more reflective type of rumination, we could assess whether emotion regulation flexibility predicted greater use of reflective rumination or brooding-rumination, and their respective contributions to mental health. The scale utilized in this study measured more depression-related rumination. Perhaps those who are less flexible get stuck in the ruminative stage and are unable to progress to problem solving.

In sum, our findings suggest that in a repertoire of reappraisal, acceptance, suppression, distraction, rumination and experiential avoidance, use of reappraisal and, inversely, acceptance and rumination (and, to some extent experiential avoidance), make the strongest contributions to mental health. The other strategies -- suppression and distraction -- mattered relatively less to overall mental health. Thus, repertoire may play an important factor in emotion regulation success and overall well-being, but as previous research has also found, this may depend in large part on the type of strategies included in the repertoire.

### **Emotion Regulation Flexibility**

Flexibility, as measured with the FREE scale, did not show a relationship to mental health in this sample. While the FREE assesses the ability to up- and down-regulate emotional expression and is a useful scenario-based scale, I also would argue strategy switching is an important component of emotion regulation flexibility, which we did not assess in the present study. A situation-specific scale or a laboratory-based behavioral study may better assess this full conceptualization of emotion regulation flexibility. For example, Birk and Bonanno (2016) showed participants negative emotional pictures and examined whether participants chose to switch from a non-optimal to an optimal emotion regulation strategy, and whether switching frequency predicted life satisfaction. They found that as emotional intensity increased, participants switched more frequently from reappraisal to distraction, which was adaptive in this context. This increase was also associated with higher life satisfaction.

Katz, et al. (2016) created a questionnaire aimed to assess flexibility through situational use of four emotion regulation strategies (distraction, reappraisal, brooding, and acceptance). In the State Emotion Regulation Inventory (SERI), individuals are asked to consider a distressing event and indicate how often they used these different strategies to address their negative thoughts. While the SERI is designed to only look at the subscales and is not a measure of general emotion regulation use, it would be a useful scale to assess flexibility in a situational-based scale. Thus, while flexibility played no role in mental health in this sample, an incomplete picture of flexibility was assessed. This limits the interpretation of our results.

### **Limitations**

There were a number of limitations of the present study. First, the sample was relatively small and homogeneous. A larger, more diverse sample would have allowed us to gain a better view of repertoire and flexibility and to include more variables and paths in our model. Second, as this was a questionnaire study, everything is self-report and retrospective. Particularly when attempting to investigate emotion regulation strategies, a behavioral study may be more ecologically-valid, as individuals often are unaware or simply incorrect about how they regulate their emotions. Finally, as many studies have not looked at this many emotion regulation strategies, it is important to consider what each scale is designed to measure. Many ask how individuals deal with distressing or upsetting feelings. However, we did not examine how often individuals experience distressing or upsetting feelings. It is difficult to know how aware individuals are of their emotions and the strategies they use to regulate them. Emotion regulation strategies can become so engrained and automatic, we may not be able to measure them properly – especially through a questionnaire. While much regulation is automatic, it is often assessed as though regulation is explicit. Further, many individuals may not truly understand how they regulate their emotions and thus rely on an assumption, or guess, based on recent behavior or events. Additionally, as we all have unique personalities and respond to and experience emotions differently, emotion regulation strategies may unveil themselves in different manners. In a situation where reappraisal is successful for one person, it may not be for all. Thus, while this research is an important stepping stone in furthering our understanding of repertoire and the effects of different emotion regulation strategies, it does not reveal the whole picture.

## **Conclusion**

In this sample, reappraisal, acceptance, rumination, and to a lesser extent experiential avoidance were the most important strategies in terms of mental health. The significant influence these strategies had on overall mental health and the non-significant influence of suppression and distraction suggest labeling strategies a priori as “good” or “bad” fails to take into account the influence strategies have on each other in an emotion regulation repertoire. For example, when looking at the larger picture, suppression may not be as detrimental as is often thought, and as we originally hypothesized. As we continue to learn more about individual emotion regulation

strategies and how they interact with each other in different populations, we will be able to better help those struggling to regulate their emotions most effectively. By including more strategies in psychological research, we may be able to facilitate a better understanding of emotion regulation and well-being. As only once we know more about *all* the strategies we use to regulate our emotions, can we then help those in need of more effective regulation.

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Table 1.

Means and Standard Deviations of Study Variables

Measure	<i>M</i>	<i>SD</i>
Suppression	3.59	1.21
Reappraisal	4.89	0.96
Distraction	4.16	0.73
Rumination	3.04	0.90
Acceptance	3.60	1.09
Experiential Avoidance	3.27	0.72
Emotion Regulation Flexibility	4.09	0.69
Mental Health	4.14	0.95

*Note: All ER strategy questionnaires were scaled so higher scores indicate greater use. ER flexibility was scaled so a higher score meant more flexibility. Mental health was scored so a higher score meant better mental health, or lower psychopathology.*

Table 2.

Correlations among Study Variables

Variables	1	2	3	4	5	6	7	8
1. Suppression	-							
2. Reappraisal	-.134	-						
3. Distraction	.025	.154*	-					
4. Rumination	.170*	-.276**	-.074	-				
5. Acceptance	.129	-.281**	-.152*	.282**	-			
6. Experiential Avoidance	.405**	-.080	-.063	.479**	.156*	-		
7. Emotion Regulation Flexibility	-.278**	-.006	.137	-.105	-.042	-.333*	-	
8. Mental Health	-.222**	.417**	.093	-.576**	-.312**	-.385**	.092	-

\*  $p < 0.05$ , \*\*  $p < 0.01$

Table 3.

Hierarchical Regression

	<i>B</i>	<i>SE B</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$
Step 1				.17**	
Reappraisal	.41	.07	.42**		
Step 2				.22**	.04**
Reappraisal	.35	.07	.36**		
Acceptance	-.18	.06	-.21**		
Step 3				.22**	.01
Reappraisal	.36	.07	.36**		
Acceptance	-.18	.06	-.21**		
Flexibility	.12	.09	.09		
Step 4				.44**	.21**
Reappraisal	.26	.06	.26**		
Acceptance	-.09	.05	-.10		
Flexibility	-.02	.09	-.02		
Suppression	-.04	.05	-.05		
Distraction	.00	.08	.00		
Rumination	-.43	.07	-.40**		
Experiential Avoidance	-.18	.10	-.14		
Step 5				.44**	.01
Reappraisal	.27	.06	.27**		
Acceptance	-.08	.06	-.09		
Flexibility	-.01	.09	-.01		
Suppression	-.04	.05	-.05		
Distraction	-.02	.08	-.01		
Rumination	-.41	.08	-.39**		
Experiential Avoidance	-.21	.10	-.16*		
Suppression X Flexibility	.08	.08	.07		
Distraction X Flexibility	-.02	.11	-.01		
Rumination X Flexibility	.12	.11	.08		
Experiential Avoidance X Flexibility	-.16	.13	-.10		

APPENDIX A  
EMOTION REGULATION QUESTIONNAIRE (ERQ)

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>strongly disagree</b>			<b>neutral</b>			<b>strongly agree</b>

1. When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.
2. I keep my emotions to myself.
3. When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
4. When I am feeling *positive* emotions, I am careful not to express them.
5. When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
6. I control my emotions by *not expressing them*.
7. When I want to feel more *positive* emotions, I *change the way I'm thinking about the situation*.
8. I control my emotions by *changing the way I think about the situation I'm in*.
9. When I am feeling *negative* emotions, I make sure not to express them.
10. When I want to feel less *negative* emotions, I *change the way I'm thinking about the situation*.

APPENDIX B

THOUGHT CONTROL QUESTIONNAIRE, DISTRACTION SUBSCALE (TCQ-D)

Most people experience unpleasant and/or unwanted thoughts (in verbal and/or picture form). Which can be difficult to control. We are interested in the techniques that you *generally* use to control such thoughts.

Below are a number of things that people do to control these thoughts. Please read each statement carefully and indicate how often you use each technique by *circling* the appropriate number. There are no right or wrong answers. Do not spend too much time thinking about each one.

*When I experience an unpleasant / unwanted thought:*

	Never	Sometimes	Often	Almost Always
1. I call to mind positive images instead	1	2	3	4
9. I occupy myself with work instead	1	2	3	4
16. I think pleasant thoughts instead	1	2	3	4
19. I do something that I enjoy	1	2	3	4
21. I think about something else	1	2	3	4
30. I keep myself busy	1	2	3	4



APPENDIX C

SADNESS AND ANGER RUMINATION INVENTORY (SARI)

Please indicate how often you do the following things when you are angry or sad.

- 1- Never
  - 2- Almost Never
  - 3- Sometimes
  - 4- Almost Always
  - 5- Always
- 
1. I get absorbed in thinking about why I am sad and find it difficult to think about other things.
  2. When something makes me sad, I turn this matter over and over again in my mind.
  3. I have difficulty getting myself to stop thinking about how sad I am.
  4. I keep thinking about the reasons for my sadness.
  5. When I think about my anger, I become more upset.
  6. I have difficulty getting myself to stop thinking about how angry I am.
  7. When I am angry, the more I think about it the angrier I feel.
  8. When something makes me angry, I turn this matter over and over again in my mind.

APPENDIX D  
ACCEPTANCE SCALE

Below you will find a list of statements. Please rate how true each statement is for you by checking a number next to it.

- 1 – Never true
- 2- Very Seldom true
- 3- Seldom true
- 4- Sometime true
- 5 – Frequently true
- 6- Almost always true
- 7- Always true

1. I often try to control or change my thoughts and feelings.
2. When I feel depressed, worried or anxious, I **do not** try to influence or change these feelings.
3. I let my thoughts and feelings come and go, without trying to control or avoid them.
4. I do the things I want to do, even if it makes me feel nervous or anxious.
5. When I feel anxious, worried or depressed, I note these feelings but live my life the way I want to.
6. When I feel depressed, worried or anxious, I **do not** try to avoid these feelings.
7. When I feel depressed, worried or anxious, I try to influence or change these feelings.

APPENDIX E

BRIEF EXPERIENTIAL AVOIDANCE QUESTIONNAIRE (BEAQ)

Please indicate the extent to which you agree or disagree with each of the following statements.

	1 Strongly disagree	2 Moderately disagree	3 Slightly disagree	4 Slightly agree	5 Moderately agree	6 Strongly agree			
1.	The key to a good life is never feeling any pain.			1	2	3	4	5	6
2.	I'm quick to leave any situation that makes me feel uneasy.			1	2	3	4	5	6
3.	When unpleasant memories come to me, I try to put them out of my mind.			1	2	3	4	5	6
4.	I feel disconnected from my emotions.			1	2	3	4	5	6
5.	I won't do something until I absolutely have to.			1	2	3	4	5	6
6.	Fear or anxiety won't stop me from doing something important.			1	2	3	4	5	6
7.	I would give up a lot not to feel bad.			1	2	3	4	5	6
8.	I rarely do something if there is a chance that it will upset me.			1	2	3	4	5	6
9.	It's hard for me to know what I'm feeling.			1	2	3	4	5	6
10.	I try to put off unpleasant tasks for as long as possible.			1	2	3	4	5	6
11.	I go out of my way to avoid uncomfortable situations.			1	2	3	4	5	6
12.	One of my big goals is to be free from painful emotions.			1	2	3	4	5	6
13.	I work hard to keep out upsetting feelings.			1	2	3	4	5	6
14.	If I have any doubts about doing something, I just won't do it.			1	2	3	4	5	6
15.	Pain always leads to suffering.			1	2	3	4	5	6

APPENDIX F

FLEXIBLE REGULATION OF EMOTIONAL EXPRESSION (FREE) SCALE

Displaying emotion is a regular part of our daily lives. For social reasons, sometimes we have to express more emotion than we are feeling, and sometimes we have to display less emotion than we are feeling.

The following scenarios involve POSITIVE emotion. For each scenario, indicate how well you would be able to be even MORE EXPRESSIVE than usual of how you were feeling:

	Unable					Very Able
	1	2	3	4	5	6
1) A friend wins an award for a sport that doesn't interest you.	1	2	3	4	5	6
2) A coworker gets a promotion and wants to talk about it.	1	2	3	4	5	6
3) A friend is talking about a great date she had the other night.	1	2	3	4	5	6
4) You receive a gift from a family member but it's a shirt you dislike.	1	2	3	4	5	6

The following scenarios involve NEGATIVE emotion. For each scenario, indicate how well would you be able to be even MORE EXPRESSIVE than usual of how you were feeling:

	Unable					Very Able
	1	2	3	4	5	6
5) Your friend is telling you about what a terrible day they had.	1	2	3	4	5	6
6) Your boss is complaining about a project you know little about and have no involvement with.	1	2	3	4	5	6
7) A friend is talking about a break-up that you secretly think is a good thing.	1	2	3	4	5	6
8) You're attending the funeral of someone you don't know.	1	2	3	4	5	6

The following scenarios involve POSITIVE emotion. For each scenario, indicate how well would you be able to CONCEAL how you were feeling.

	Unable					Very Able
	1	2	3	4	5	6
9) While having dinner with a friend who has recently lost their job, you receive a phone call from your boss stating you will get a raise.	1	2	3	4	5	6
10) You are in a training session and you see an accidentally funny typo in the presenter's slideshow.	1	2	3	4	5	6
11) You're a guest at a solemn religious ceremony and the person sitting next to you just whispered a funny joke.	1	2	3	4	5	6
12) During a meeting with a supervisor, his/her phone unexpectedly begins to play an embarrassing ringtone.	1	2	3	4	5	6

The following scenarios involve NEGATIVE emotion. For each scenario, indicate how well would you be able to CONCEAL how you were feeling.

Unable Very  
Able



	1	2	3	4	5	6
13) You are at a social event and the person you're talking to frequently spits while they speak.						
14) You have just heard about the death of a close relative right before an important meeting.	1	2	3	4	5	6
15) You are on a first date at a restaurant having dinner, and a stranger spills their drink on you.	1	2	3	4	5	6
16) After you have a very irritating and stressful day, a sometimes-annoying neighbor stops by to say hello.	1	2	3	4	5	6

APPENDIX G  
MENTAL HEALTH INVENTORY (MHI-5)

How much of the time, during the last month, have you...?

	None of the time					All of the time
1) Been a very nervous person?	1	2	3	4	5	6
2) Felt calm and peaceful?	1	2	3	4	5	6
3) Felt downhearted and blue?	1	2	3	4	5	6
4) Been a happy person?	1	2	3	4	5	6
5) Felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6

APPENDIX K  
INFORMED CONSENT

Dear Participant:  
**CONSENT FORM**

**The Cognitive Neuroscience of Trust**

I am Dr. Adam Cohen and I am a Professor in the Department of Psychology at Arizona State University. [Please note: If you are participating in the study at ASU's West campus, the parts below in *gray/italics* do not apply.]

I am conducting a research study wherein you will be asked to evaluate other people, *while wearing an EEG cap that will measure neural activity. In addition, we will be collecting other physiological measures that will require that sensors be attached to you.* You will be asked to wear these sensors for the entire time while you are completing the task. Small sensors will be attached to your hand, just below your collar bone, on your lower rib cage, on your neck, and on your back using adhesive tape or self-stick sensors. These sensors measure your heart rate and sweat on the skin, and give us a measure of how your body systems are functioning as you visualize. A belt attached with Velcro also will go around your torso (outside of your clothing) to measure respiration rate. These sensors produce minimal discomfort. They may feel similar to wearing stickers or band-aids and are attached and removed quickly and easily. After the sensors are attached, the experimenter will ask if you are experiencing any discomfort. If you let the experimenter know you are uncomfortable, the sensors will be readjusted until you are more comfortable. Finally, we will also ask you to wear a blood pressure cuff on your left arm. The expected duration of the study is *3 hours*. [West campus lab session is ~1.5 hrs, with ~30-45min of questionnaires beforehand]

You will be asked to answer *interview and* survey questions before and after the study. You may also choose to skip any question you do not wish to answer. Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty (i.e., it will not affect your grade). *You must be 18 years of age or older to participate in this study.*

*To participate in this study, you must not have dyed hair. The EEG cap will be soaked in a saline solution (Potassium Chloride; KCl), which can remove hair color or damage dyed hair. KCl should not affect non-dyed hair (and may not affect certain hair dye) and is used in common shampoo products (e.g., Suave, Sunsilk).*

There may be no direct benefits to you, but the possible benefits of your participation in the research include extending your knowledge about research within the field of psychology and gaining experience as part of the scientific process., it is possible there may be some slight discomfort associated with wearing *the EEG cap*, sensors and blood pressure cuff, and you may experience fatigue due to the length of the study. The risks involved in this study are no greater than what you would experience in your daily life. The data we collect will only be attached to your randomly-assigned participant number. Your responses, therefore, will be confidential. The results of this study may be used in reports, presentations, or publications, but your name will not be used.

This research is being sponsored by the US Federal government and they may have access to data and research records, for the purpose of protecting human subjects. All data from this project will be confidential and kept in password protected files, accessible only by the research team. If you choose to withdraw from the study, you must do so before you leave your experimental session today, because we will not be able to remove your data after you leave, because of its confidential nature.

If you have any questions concerning the research study, please contact the research team at: 480-965-7345 or email adamcohen@asu.edu. [WEST CAMPUS CONTACT: Dr. Nicole Roberts, 602-543-4524, Nicole.A.Roberts@asu.edu] If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

You will receive a minimum of \$20 or, for particular courses, Sona research credit, for participating in this study.

Sincerely,  
Adam Cohen, Ph.D. [West campus contact: Nicole A. Roberts, Ph.D.]  
I have read this consent form and would like to participate.

By clicking the red button to proceed to the next page you indicate your consent and willingness to participate in this study.

APPENDIX L  
IRB APPROVAL



APPROVAL:CONTINUATION

Adam Cohen  
Psychology  
480/965-7345  
Adam.Cohen@asu.edu

Dear Adam Cohen:

On 6/20/2017 the ASU IRB reviewed the following protocol:

Type of Review:	Continuing Review
Title:	The Impact of Religion and Culture on Trust
Investigator:	Adam Cohen
IRB ID:	STUDY00001071
Category of review:	(4) Noninvasive procedures, (7)(b) Social science methods, (7)(a) Behavioral research
Funding:	Name: DOD-USAF-AFRL: Air Force Office of Scientific Research (AFOSR)
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"><li>• Cohen - consent_credit Final.pdf, Category: Consent Form;</li><li>• changed in payment consent form, debriefing, Category: Consent Form;</li><li>• Cohen - consent_paid final.pdf, Category: Consent Form;</li><li>• debriefing.pdf, Category: Consent Form;</li></ul>

The IRB approved the protocol from 6/20/2017 to 6/14/2018 inclusive. Three weeks before 6/14/2018 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 6/14/2018 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Gene Brewer  
Gene Brewer



Derek Ellis  
Amal Fakhouri  
Christopher Blais  
Kimberly Wingert  
Cayla Duncan  
Marin Schmitt  
Nicole Roberts  
Stephanie Billingsley  
Adam Cohen