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A trauma analogue study investigating the role of attentional shifting in emotion regulation

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ABSTRACT

A TRAUMA ANALOGUE STUDY INVESTIGATING THE ROLE OF ATTENTIONAL SHIFTING IN EMOTION REGULATION

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Trauma-focused research has shown that high attentional control serves as a buffer against posttraumatic stress symptoms and other pathology. However, less is known in regard to the influence of attentional processes on the effectiveness of treatment strategies used to reduce symptoms. The current project used an analogue design to examine the impact of participants' ability to flexibly shift attention on the effectiveness of two prominent emotion regulation strategies in managing distress and trauma-related symptoms (i.e. negative affect, intrusive thoughts, and avoidance). Undergraduate students (N = 153) completed a dot-probe task incorporating stimuli that elicit negative emotions and trauma-related stimuli to assess attentional shifting ability. Participants were randomly assigned to learn either cognitive reappraisal or acceptance to regulate their emotions during a trauma analogue film. Results revealed that distress did not differ based upon the emotion regulation strategy participants used. Additionally, negative affect and intrusive thoughts did not differ based upon level of attentional shifting ability. Individuals with lower attention shifting ability with regard to trauma-related stimuli exhibited lower levels of avoidance than individuals with higher attention shifting ability. This result was not found using attention shifting ability with negatively valenced stimuli. Further, attention shifting ability and emotion regulation strategy did not interact to predict negative affect or intrusive thoughts. However, there was a significant interaction between attention shifting ability with regard to negatively valenced stimuli and emotion regulation strategy on

negative affect. Methodological limitations that may have accounted for the largely null findings are discussed.

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A TRAUMA ANALOGUE STUDY INVESTIGATING THE ROLE OF ATTENTIONAL SHIFTING IN EMOTION REGULATION

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CHAPTER 1

INTRODUCTION

The prevalence of exposure to traumatic events among individuals in the United States is quite high. The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-5*; American Psychiatric Association [APA], 2013) defines a traumatic event as an incident that involves actual or threatened death, serious injury, or sexual violence, and is directly or indirectly experienced, witnessed, learned about, or experienced through repeated or extreme exposure to aversive details. In a recent nationally representative survey of adults in the U.S. (*N* = 2,953) using the *DSM-5* (APA, 2013) definition of a traumatic event, 89.7% of participants reported exposure to at least one traumatic event in their lifetime (Kilpatrick et al., 2013). The majority of the sample experienced more than one type of event; with the modal number of event types experienced being three, and one-third of the sample reporting exposure to six different types of traumatic events.

Exposure to traumatic events can result in many negative psychological outcomes. Research has identified exposure to trauma as a risk factor for substance use problems, including alcohol, nicotine, and illicit drug problems (Read et al., 2012; Ullman, Relyea, Peter-Hagene, & Vasquez, 2013; Waldrop & Cohen, 2014), social anxiety disorder (Collimore, Carleton, Hofmann, & Asmundson, 2010), generalized anxiety disorder (Grant, Beck, Marques, Palyo, & Clapp, 2008), and major depressive disorder (Dekel, Solomon, Horesh, & Ein-Dor, 2014; Shalev et al., 1998). One of the most commonly discussed psychological consequences of exposure to

trauma is posttraumatic stress disorder (PTSD), which has high rates of co-morbidity with other adverse psychological consequences including substance abuse, anxiety, and depression (Ginzburg, Ein-Dor, & Solomon, 2010; Grant et al., 2008; Ullman et al., 2013).

In the *DSM-5* (APA, 2013), PTSD falls under a group of disorders entitled "Trauma- and Stressor-Related Disorders." These disorders share the first criterion of PTSD: exposure to a traumatic event (Criterion A). PTSD is characterized by four clusters of symptoms: re-experiencing the traumatic event (Criterion B); avoidance of thoughts, feelings, and/or external reminders of the event (Criterion C); negative cognitions and/or mood (Criterion D); and alterations in arousal (Criterion E). These symptoms need to be present for at least one month (Criterion E) and be accompanied by significant distress or impairment (Criterion F) to establish a clinical diagnosis of PTSD.

The National Stressful Events Survey (Kilpatrick, Resnick, Baber, Guille, & Gros, 2011) assessed the prevalence of PTSD using the *DSM-5* definition with a large internet sample of adults in the U.S. (N = 2,953). The estimated lifetime prevalence of PTSD was 8.3%, while past 12-month and past 6-month prevalence rates were 4.7% and 3.8%, respectively (Kilpatrick et al., 2013). The authors also estimated the rates of PTSD prevalence according to the older criteria in the *Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition* (*DSM-IV*, APA, 2000). The major revisions from the *DSM-IV* to the *DSM-5* include changes to the traumatic event criterion, which include the elimination of the requirement that the traumatic event be accompanied by subjective fear, helplessness, or horror, and alterations to the symptom clusters to expand the scope of symptoms (Friedman, Resick, Bryant, & Brewin, 2011). Further, given that most research examines PTSD symptoms in relation to only one traumatic event, the authors examined the rates of PTSD resulting from multiple traumas to determine whether using these

criteria would yield different prevalence rates. The *DSM-5* prevalence rates in the survey were slightly lower than the *DSM-IV* estimates. The only statistically significant differences were found when examining prevalence of PTSD as resulting from multiple traumatic events (versus an isolated incident). The prevalence of *DSM-5* past 12-month PTSD, as well as *DSM-5* lifetime PTSD, as assessed using criteria met to a combination of events (i.e., multiple events) significantly differed from *DSM-IV* past 12 month and lifetime rates. The biggest factors for those who met criteria for *DSM-IV* but not *DSM-5* PTSD were the exclusion of sudden, unexpected death not due to violence as a traumatic event, and the failure to have at least one active avoidance symptom (Kilpatrick et al., 2013).

The National Stressful Events Survey prevalence estimates of PTSD are slightly higher than those obtained in prior research. In the National Comorbidity Survey-Replication, a nationally representative sample of U.S. adults (N = 9,828) in which psychiatric disorders were assessed among a subsample (n = 5,692), the lifetime prevalence rate of PTSD based on *DSM-IV* diagnostic criteria was 6.8% (Kessler et al., 2005). Kilpatrick and colleagues (2013) denote several potential reasons for the slight difference, including demographic changes in the U.S. population, as the NCS-R was based upon the 2000 Census in comparison to the National Stressful Events Survey weighted to be representative of the 2010 Census. Additionally, methodological differences were noted given that the NCS-R used an in-person assessment strategy in comparison to an online study. Future research is warranted to confirm the prevalence of PTSD. Overall, the prevalence estimates of PTSD suggest that PTSD affects less than ten percent of adults exposed to traumatic events.

The large difference between the rates of exposure to a traumatic event and the rates of PTSD imply that there may be common factors that influence the development of PTSD and/or

recovery from trauma exposure. Prominent cognitive and information-processing models of PTSD suggest that the manner in which individuals process trauma-related information leads to a sense of threat that influences trauma-related distress (Ehlers & Clark, 2000; Resick & Schnicke, 1992). Interpretations that are erroneous or extreme about the causes or consequences of the traumatic event (e.g., the world is completely dangerous) can be maladaptive and lead to problematic avoidant behavioral and cognitive coping responses intended to reduce the sense of threat (e.g., avoiding shopping malls due to fear of unknown danger). However, these strategies prevent change in event-related interpretations and instead maintain posttraumatic stress symptoms. Behavioral models of PTSD highlight the avoidance of trauma-related thoughts and stimuli, which prevents habituation to the sense of threat or fear (Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989). Avoidance can be subsumed under the higher order construct of emotion regulation. Problematic emotion regulation has recently received much attention as one of the maintaining features of PTSD and trauma-related disorders (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Gross & Jazaieri, 2014; Tracy, Klonsky, & Proudfit, 2014).

Emotions and Emotion Regulation

Although there has been longstanding interest in the construct of emotion regulation, there is considerable diversity in its definition. Thompson (1994) provided an initial inclusive definition of this concept to integrate the prominent characterizations of emotion regulation. According to Thompson (1994), "emotion regulation consists of the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (p. 27). Of note, Thompson

(1994) differentiates emotional reactions from emotion regulation. Although this distinction is not always made, or deemed necessary (Gross & Barrett, 2011; Gross, Sheppes, & Urry, 2011), for the purposes of this study, it is important as it distinguishes the process that generates an emotion (i.e., emotional reactions) from the processes that influence an ongoing or anticipated emotion (i.e., emotion regulation). One significant difference between these two processes is that the goal of emotion regulation is to influence the emotion-generative process (Barrett, Ochsner, & Gross, 2007; Gross, 2014; Gross & Thompson, 2007).

Inherent in Thompson's (1994) definition is the notion that emotion regulation targets the identification, maintenance, enhancement, inhibition, and/or restraint of all emotions, whether positive or negative. Moreover, these processes can occur for the purposes of regulating one's own emotions as well as managing the emotions of others. Additionally, Thompson noted that emotion regulation targets the intensity of emotions, as well as the persistence of and recovery from the emotion that is experienced. Lastly, Thompson points to the importance of understanding the context in which emotion regulation occurs, particularly individual and situational differences that may alter the goals of the individual.

While Thompson's (1994) definition remains one of the prevalent conceptualizations of emotion regulation, he acknowledged that many issues could not be addressed in his definition alone. Further, he pointed to the utility of process models of emotion regulation, which highlight the elements of emotion regulation as it occurs (Thompson, 1994). James Gross' (1998a) process model is the most prominent framework for understanding the various elements of emotion regulation as it unfolds. This model builds off of the emotion-generative process model, otherwise known as the "modal model" of emotion (Barrett, Ochsner, & Gross, 2007; Gross & Thompson, 2007).

The "Modal Model" of Emotion

According to the modal model of emotion (Figure 1; Barrett, Ochsner, & Gross, 2007; Gross & Thompson, 2007), there is a small set of discrete emotions that are generated automatically through four steps. First, a *situation* occurs, whether external (e.g., a spider crawling onto a lunch table) or internal (e.g., having the thought "I am worthless"). This situation commands an individual's *attention* and results in *appraisals* or evaluations of the situation. Finally, a flexible, multisystem, whole-body *response* is generated, which may involve changes in behavioral, biological, and experiential systems (e.g., experiencing fear at the spider). This response can then alter the initial steps, such as by changing the situation (e.g., by killing the spider) and begin this sequence again. In changing the initial steps in the process, the whole body response can engender an additional emotional response (e.g., experiencing guilt after killing the spider). Thus, this model is thought of as ongoing and cyclical (Gross & Thompson, 2007). Regulation can occur at any point in this emotion-generative process.

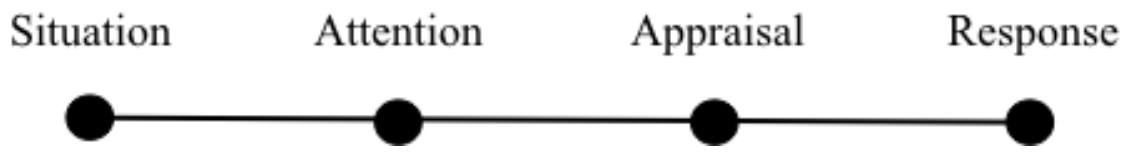

Figure 1. The modal model of emotion.

The Process Model of Emotion Regulation

As noted, there are different perspectives on the separation between the emotion-generative process and the emotion regulation process. Gross and Barrett (2011) suggest that the "modal model" of emotion and Gross' (1998a, 2014) process model of emotion regulation appear to be overlapping models that are not sharply distinct. While the modal model focuses specifically on the chain of events that result in an emotional response, Gross' (1998a, 2014) process model of emotion regulation (Figure 2) emphasizes five particular families of processes that impact the emotion-generative process: situation selection, situation modification, attentional deployment, cognitive change, and response modulation.

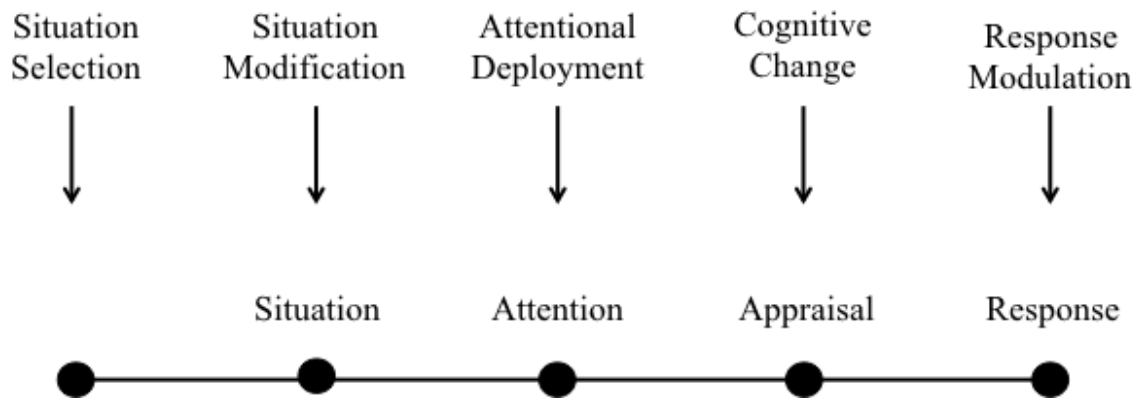

Figure 2. The process model of emotion regulation.

Situation Selection

Situation selection primarily targets the initial step of the emotion generative sequence. This family of processes influences the likelihood that an individual will experience a situation expected to result in emotions that may be desirable or undesirable. Strategies in this family of processes enable individuals to take specific actions and approach or avoid certain people, places, or things that are expected to lead to emotional responses (Gross & Thompson, 2007). For example, one may seek out a comedy show expecting to feel joy or happiness after a bad day at work. These strategies require an understanding of the features of these situations and the emotional meaning of, or likely response to, these situations. Situation selection may be particularly difficult as people often incorrectly estimate their emotional responses, such as by over-estimating the probability of undesirable emotions (e.g., catastrophizing; Beck, 1963/1970; Garnefski & Kraaij, 2006; Garnefski, Kraaij, & Spinhoven, 2001).

Situation Modification

Situation modification refers to efforts taken to directly alter the features of the situation in an attempt to influence the emotional response. Notably, these processes target the external features of a situation and are differentiated from internal situations, which are targeted in the context of cognitive change (Gross, 2014; Gross & Thompson, 2007). For example, an individual may choose to not talk about work while at the comedy show in order to avoid negative emotions. Modifying the features of a situation may result in an entirely new situation, making it somewhat difficult to distinguish between situation selection and situation

modification. Both of these families target the situation step in the emotion-generative process, specifically by focusing on the external environment.

Attentional Deployment

Attentional deployment processes focus on the second step of the emotion-generative process: how individuals attend to a situation. This family of processes includes focusing on non-emotional aspects of a situation, moving attention away from a situation, selecting new internal situations, directing attention to different features of the situation or stimulus, or redirecting attention to an entirely different situation (Gross, 2014; Gross & Thompson, 2007). These processes parallel those in situation selection and situation modification; however, attentional deployment is focused on changing internal focus rather than the external environment. One major strategy used in this family of processes is broadly termed *concentration*, and refers to when attention is directed toward the emotional features of a situation and consequences (Gross & Thompson, 2007). Rumination is an extreme form of concentration during which individuals repetitively think about the causes, consequences, and associated symptoms of their emotions, typically in regard to negative affect (Treynor, Gonzalez, & Nolen-Hoeksema, 2003; Watkins, 2008). For example, if the individual who had a bad day at work repetitively thought about the various factors that made the day bad and how negative they feel, they would be engaging in rumination.

Cognitive Change

Cognitive change takes place during the appraisal step of the emotion generative process and refers to changing how one thinks about either the situation or one's ability to manage the situation. Unlike the previous families, cognitive change processes typically apply to both external and internal situations (Gross, 2014). For example, the individual who had a bad day at work may reappraise the situation as less negative by comparing the situation with that of a less fortunate person. An example of cognitive change applied to an internal experience is that of the physically aroused athlete prior to a competition who re-interprets the arousal that may result from anticipatory anxiety to "getting pumped up" for the competition. Cognitive reappraisal is a common strategy in this family and specifically refers to altering the meaning of a situation in order to influence the resulting emotion (Gross & John, 2003; Gross & Thompson, 2007). This strategy can be used to both up- and down-regulate emotion. That is, it can be used to decrease as well as increase both positive and negative emotion (McRae, Ciesielski, & Gross, 2012; Ray, Ochsner, McRae, & Gross, 2010). Laboratory studies using emotional film clips have shown that participants instructed to use cognitive reappraisal reported less negative emotion in comparison to individuals in the "watch" condition who received no instructions other than to carefully watch the film clip (e.g., Gross, 1998a; Wolgast, Lundh, & Viborg, 2011).

Response Modulation

Response modulation focuses on the last step in the emotion-generative process and refers to attempts made to influence the emotional response. This family of processes targets the

physiological, experiential, and/or behavioral aspects of the emotional response (Gross, 2014; Gross & Thompson, 2007). For example, relaxation methods such as breathing retraining may be used to decrease the physiological response to anxiety provoking situations. Emotional suppression is a common strategy used in this family of processes during which individuals attempt to inhibit the expression of an ongoing emotion (Gross, 2014; Gross & John, 2003). This may occur through avoidance, such as avoiding talking about an argument with a partner that was not resolved. Another response modulation strategy is acceptance, which is characterized by a shift from the urge to alter, avoid, or control the emotional response to instead allow the emotional response to unfold (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hofmann & Asmundson, 2008). By using this strategy, an individual would experience the emotional response as it occurs naturally. This strategy changes the relationship of the individual to the emotion, as the individual now embraces each emotional experience rather than fighting against or avoiding emotions.

Temporal Dimension

Gross' (1998a, 2014) original process model of emotion regulation also distinguishes processes on a temporal dimension based upon when each strategy is used in relation to the generation of the emotional response. Strategies that modulate emotion before the response are termed antecedent-focused strategies; those that modulate emotion after the response are termed response-focused strategies (Gross 1998b; Gross, 2014). Antecedent focused strategies include those in the situation selection, situation modification, attentional deployment, and cognitive change families (e.g., cognitive reappraisal), whereas response-focused strategies include

suppression, acceptance, and other forms of response-modulation processes. Considerable empirical research has compared the effectiveness of these two forms of strategies on reducing distress and psychological symptoms, with much evidence pointing to the benefit of using antecedent-focused strategies over response-focused strategies (Gross, 1998b; Gross, 2002; Muraven & Baumeister, 2000; Webb, Miles, & Sheeran, 2012).

Antecedent focused strategies are found to be more effective because they do not allow emotional responses to fully develop, whereas response-focused strategies must overcome the expression of an already fully developed emotion (Gross, 1998b; Webb et al., 2012). While both strategies have been found to reduce emotional expression, response-focused strategies such as suppression have been found to increase physiological arousal, potentially increasing the unwanted emotional response (e.g. Webb, Miles, & Sheeran, 2012). However, there are situations in which response-focused strategies may be effective as well (Aldao, 2013). For example, suppression may be beneficial if an individual is experiencing anxiety about giving an important and mandatory lecture, as the behavioral aspects of the emotional response may interfere with the individual's ability to continue with the lecture. Additionally, acceptance is typically considered an adaptive response-focused strategy (Hayes et al., 2006; Hofmann & Asmundson, 2008). For example, acceptance has been shown to be associated with lower negative affect following exposure to emotionally distressing film clips in comparison to suppression or simply watching the clips (Campbell-Sills, Barlow, Brown, & Hofmann, 2006).

Given that the modal model of emotion involves repeated cycles, it may be difficult to determine when a strategy is being implemented in the development of the emotional reaction. Regulation can occur when emotions first arise and/or as it increases in intensity (Sheppes & Gross, 2012). Further, one may attempt to regulate their emotions in the antecedent phase, but

transition to a response-focused strategy if the initial, antecedent-focused attempt fails. Alternatively, unsuccessful use of a response-focused strategy (e.g., suppressing anxiety when having to speak in public) may lead one to revert back to an antecedent-focused strategy for subsequent emotional reactions (e.g., reappraising the public speech as not being important). Thus, there are limitations to separating strategies into the broad temporal dimensions of antecedent- or response-focused. However, Sheppes and Gross (2012) suggest that even when using more specific temporal framework, early interventions should be preferable to late interventions. Of note, difficulties with emotion regulation may occur at any point in the emotion-generation process, from deploying strategies at the input, to modulating processes at the output.

An Updated Model

To account for the multitude of findings produced by research on emotion regulation since the formulation of Gross' (1998) original process model, Gross (2015a) recently proposed the extended process model (EPM) of emotion regulation. A key feature of the EPM is the incorporation of a valuation system. Valuations are described as assessments of whether something is good or bad, similar to evaluations or appraisals in which a value is placed on something (Oschner & Gross, 2014). Valuation systems (Figure 3) involve cycles comprised of four elements: World-Perception-Valuation-Action. The World element refers to an internal or external state of the world that gives rise to Perception. The Valuation is the positive or negative assessment of the stimuli, taking into account the perception of the current state and the desired state. This leads to the Action element, which aims to address the gap between the perceived

state and the desired state. Valuation systems share these common elements, but are unique, dynamic, and can interact with each other (Gross, 2015a, Oschner & Gross, 2014). Using this framework, the emotion-generative process is considered a first level valuation system that is the World element giving rise to the second level valuation system of emotion regulation (Figure 4).

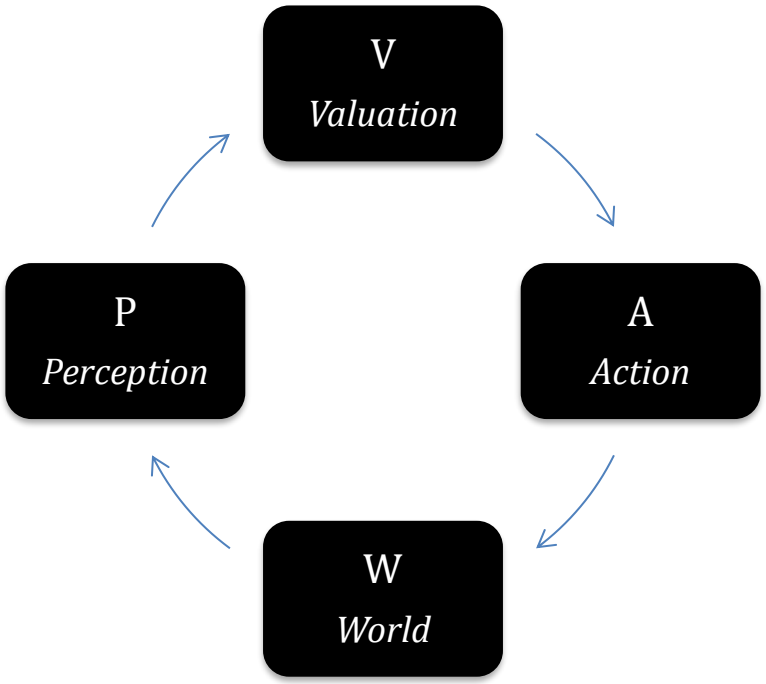

Figure 3. The Valuation system. This figure illustrates the valuation process in which an internal or external state of the world ("W") gives rise to Perception ("P"). The Valuation ("V") is the positive or negative assessment of the aspect of the world, taking into account the perception of the current state and the desired state. This leads to the Action ("A") element, which aims to address the gap between the perceived state and the desired state.

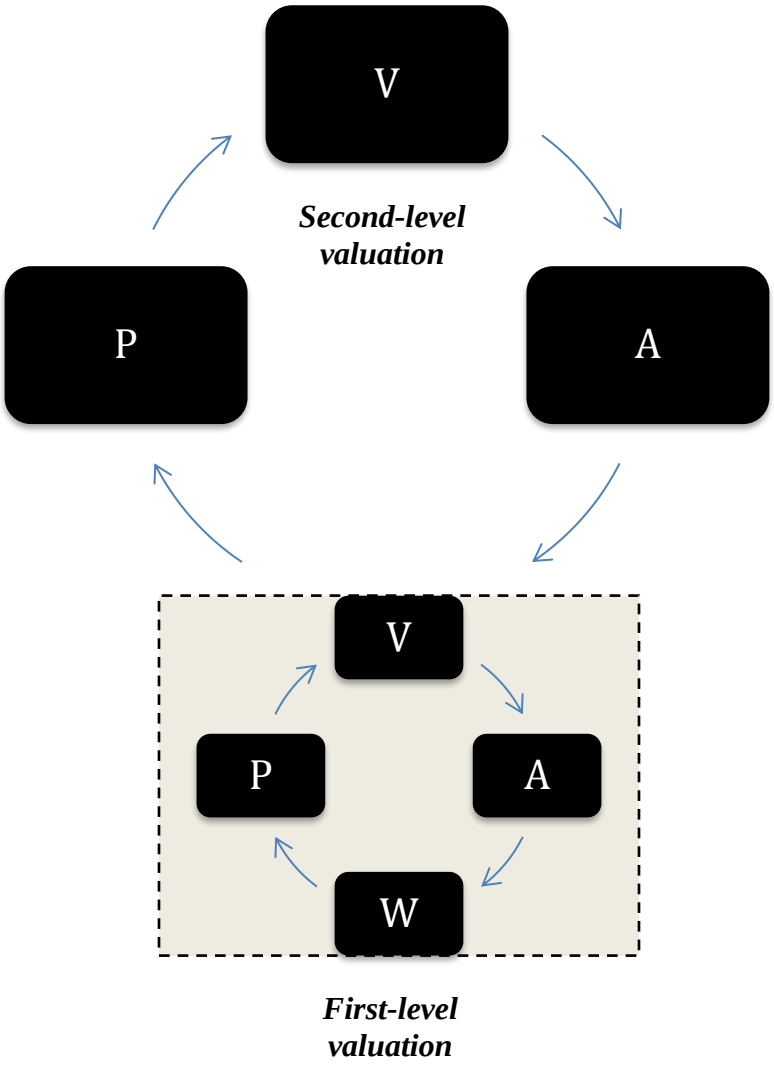

Figure 4. The interacting valuation systems. This figure illustrates the valuation perspective on emotion regulation. The interaction occurs as the emotion generation process is the aspect of the world that gives rise to the second-level valuation system of emotion regulation.

Within the original process model, the five families of emotion regulation processes target different phases of the emotion generation process. Within the EPM, the five families may impact each of the four elements of the valuation system (see Oschner & Gross, 2014 for a thorough review). It is likely that each family primarily impacts a particular element. For example, it is probable that situation selection and situation modification influence inputs to the internal or external world while attention deployment influences perception of these inputs. Cognitive change may influence the valuation step and response modulation may influence the action step. The EPM moved beyond these five families and focuses mainly on the elements of the valuation system.

The EPM describes emotion regulation as involving interactions among valuation systems over time. Specifically, Gross (2015a) posits three stages within the EPM (Figure 5) that correspond to three valuation systems: identification, selection, and implementation. These stages distinguish between when an individual decides whether or not to regulate emotion, then decides which strategy to select, and finally decides how to specifically implement the strategy. Each of these stages includes the perception, valuation, and action sub-steps. Gross (2015a) suggests that this model may be useful for explaining potential failure points in emotion regulation by examining the various elements of different regulatory stages. Sheppes, Suri, and Gross (2015) recently reviewed clinical conditions that may be associated with each regulatory stage (i.e., identification, selection, or implementation) and element (i.e., perception, valuation, and action). Currently, there is modest empirical support for the EPM (Sheppes, Suri, & Gross, 2015) and several empirical challenges have been discussed (Gross, 2015b), such as defining how the valuation systems change as they interact over time. While the current project was based upon the original process model of emotion regulation (Gross, 1998), it is important to recognize

that the EPM broadens the focus of the original model and provides an important framework for future research.

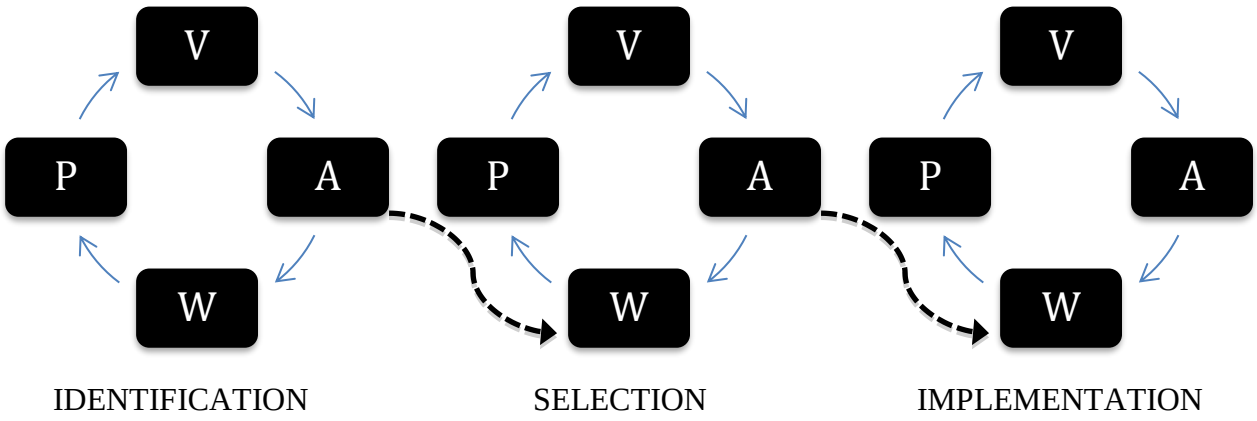

Figure 5. The extended process model of emotion regulation. This figure illustrates the interacting valuation systems of the three stages of the extended process model of emotion regulation: identification, selection, and implementation.

Trauma and Emotion Regulation

Recent research has provided evidence that emotion regulation difficulties are associated with posttraumatic stress symptoms among trauma-exposed populations. The EPM will likely

expand discussion and research of this link; however, is outside the scope of this study. A recent meta-analysis using 57 studies examined the association between emotion regulation difficulties and posttraumatic stress symptoms in a variety of trauma-exposed samples (Seligowski, Lee, Bardeen, & Orcutt, 2014). The results showed a large effect size for general emotion dysregulation (r = 0.53; k = 13). Notably, no significant differences were found based upon sample (e.g., undergraduate samples in comparison to Veterans) or trauma type (e.g., childhood maltreatment versus motor vehicle accident). A closer examination of recent cross-sectional and longitudinal studies provides salient evidence of the relationship between emotion regulation difficulties and PTSD symptoms.

For example, research with trauma-exposed undergraduate students shows a significant positive association between posttraumatic stress symptoms and difficulties understanding, processing, describing, and accepting emotional experiences, limited access to effective emotion-regulation strategies, and difficulties modulating emotions to engage in appropriate, goal-directed behavior (Lilly & Valdez, 2012; Tull, Barrett, McMillan, & Roemer, 2007; Weiss et al., 2012). Women with childhood abuse histories also endorse greater emotion regulation difficulties compared to women without abuse histories (Burns, Jackson, & Harding 2010; Lilly, London, & Bridgett, 2014). Of note, emotion dysregulation was also implicated as a mediator of the relationship between a history of abuse and posttraumatic stress symptom among these women (Burns, Jackson, & Harding, 2010; Lilly, London, & Bridgett, 2014). This highlights emotion dysregulation as a factor that is strongly associated with posttraumatic stress symptomatology following exposure to trauma, though use of longitudinal and/or prospective designs that could determine the true direction of this association has been quite limited.

One recent longitudinal study found that emotion regulation difficulties prospectively

predict posttraumatic symptom severity (Bardeen, Kumpula, & Orcutt, 2013). The authors analyzed data collected at three different time points using a large undergraduate female sample (N = 691) exposed to a campus shooting following a pre-shooting assessment session. The average time between the mass shooting and the completion of the second assessment session and third assessment session was approximately 30 days and 242 days, respectively. Using a three time-point cross-lagged panel design, the authors found that emotion regulation difficulties and posttraumatic stress symptoms mutually influenced each other from time one to time two; however, only emotion regulation difficulties at time two predicted posttraumatic stress symptoms at time three (Bardeen, Kumpula, & Orcutt, 2013). These results implicate emotion regulation difficulties as particularly relevant to the maintenance of posttraumatic stress symptoms over time and challenge the idea of emotion regulation difficulties as simply an epiphenomenon of PTSD.

Given the association between emotion regulation difficulties and posttraumatic stress, it is not surprising that many theoretical models of trauma-related psychopathology incorporate emotion regulation difficulties (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003; Gross & Jazaieri, 2014; Kring & Sloan, 2009; Kring & Werner, 2004; Mennin & Farach, 2007). Gross and Jazaieri (2014), for instance, emphasize three emotion dysregulation factors that appear to be common amongst theoretical models of psychopathology: awareness, goals, and strategies. Problems with awareness of emotions include difficulties with attending to and acknowledging emotions, whether positive or negative (Gratz & Roemer, 2004). For example, individuals with PTSD may show difficulties with hyperawareness that lead to symptoms of hypervigilance. These individuals may persistently attend to their fear, which may motivate them to continuously scan their environment for danger or threat even when no specific threat is present (e.g., in a

shopping mall). On the other hand, difficulties may appear as hypoawarenesss, such as with alexithymia, in which individuals lack the ability to recognize, describe, or understand their emotions. Notably, alexithymia has been strongly linked to PTSD, particularly to the emotional numbing cluster of symptoms (Badura, 2003; Frewen, Dozois, Neufeld, & Lanius, 2008; Frewen et al., 2008; Lilly & Valdez, 2012).

Problems with emotion regulation goals consist of difficulties considering the demands of the situation, both short-term and long-term consequences, and acting in accordance with goals for a particular emotion (Gross & Jazaieri, 2014). For example, trauma-exposed individuals may use substances to reduce symptoms of posttraumatic stress (Chilcoat & Breslau, 1998; Ullman et al., 2013), which may reduce distress in the short term. However, they may not consider the long-term consequences, such as increased substance craving and greater avoidance, which may lead to chronic PTSD symptoms (Driessen et al., 2008; McCauley et al., 2012; Ouimette, Read, Wade, & Tirone, 2010)

Problems with emotion regulation strategies refer to difficulties choosing and implementing goal-appropriate strategies. Gross and Jazaieri (2014) denote three important factors in emotion regulation choice: 1) an awareness of the differential efficacy of the multitude of strategies, 2) an assessment of the availability of resources needed to use each strategy (e.g., cognitive demands), and 3) the intensity of the emotion being regulated. Considerable research has shown that the efficacy of any given emotion regulation strategy varies across people and situations (e.g., Sheppes, Scheibe, Suri, & Gross, 2011) and context must be taken into account (for a review see Aldao, 2013). These difficulties are also apparent in PTSD. Specifically, avoidance is a core feature of PTSD in which individuals avoid situations that they believe will cause extreme fear, or emotions that are often disproportionate to the danger posed by the

situation. For example, many individuals with PTSD will avoid crowded places such as the shopping mall because these situations may feel dangerous. In this case, these individuals are choosing a strategy in the family of situation selection that may have detrimental long-term effects, including a persistence of unhabituated fear (Gross & Thompson, 2007).

Two problems with implementation of emotion regulation strategies include goal shielding and goal flexibility (Gross & Jazaieri, 2014). Goal shielding refers to the extent to which one can focus on a specific emotion regulation goal in light of other competing goals. For example, difficulties with concentration is a symptom of PTSD that can interfere with the implementation of emotion regulation strategies, as individuals may not be able to focus on their emotion regulation goals. Goal flexibility refers to the ability to adjust the goal and strategy as needed in accordance with changes to the situation or context. Bonnano and Burton (2013) posited that the most effective implementation of emotion regulation strategies is likely the one that is most flexible. The authors suggest that flexibility is accomplished by an understanding of the situational context, the ability to use different strategies, and the ability to monitor the outcome of that strategy in order to adjust as needed. Psychopathology has often been linked to rigidity in the use of emotion regulation strategies (for a review, see Aldao, 2010), such as with the relationship between rumination and depression (e.g., Nolen-Hoeksema et al., 2008) and avoidance and PTSD (e.g., Pineles et al., 2011).

Emotion Regulation and Interventions for Trauma

Given the relevance of emotion dysregulation to mental health disorders, facilitating the use of adaptive emotion regulation strategies is a significant component of treatments for trauma-

related sequelae. Traditional Cognitive-Behavioral Therapy (CBT) focuses on learning to identify thoughts, connect them to how they affect emotions and behaviors, and develop/test alternate thoughts to lead to other emotions and behaviors (Beck, Rush, Shaw, & Emery, 1979). CBT employs cognitive reappraisal as part of the cognitive restructuring process, which involves identifying and modifying particularly unhelpful thoughts that maintain or increase distress. CBT has been demonstrated to be effective for a variety of disorders and problems (e.g., Butler, Chapman, Forman, & Beck, 2006; Tolin, 2010). In particular, CBT is considered the most effective treatment for PTSD (Foa, Keane, Friedman, & Cohen, 2008). The Veteran Administration and the Department of Defense has systematically implemented two forms of CBT, Cognitive Processing Therapy (Resick & Schnicke, 1992) and Prolonged Exposure (Foa, Rothbaum, Riggs, & Murdock, 1991), as first line treatment options for PTSD among veterans. These treatments typically employ antecedent focused emotion regulation strategies. For example, research has identified cognitive change strategies as a primary mechanism of change in these treatments (Bryant, Moulds, Guthrie, Dang, & Nixon, 2003; Resick et al., 2008). Third-wave cognitive-behavioral therapies, such as Acceptance and Commitment Therapy, include an acceptance component to decrease the distress resulting from attempts to control private experiences, typically through avoidance of thoughts, emotions, and situations (ACT; Walser, Westrup, & Hayes, 2007). This differs from traditional CBT in that acceptance focuses on allowing the emotion to occur and proceed naturally even if it is undesirable, instead of attempting to alter or suppress the emotional response. These treatments typically employ response-focused strategies, in comparison to traditional CBT's use of antecedent-focused strategies. It has been suggested that acceptance targets the experiential avoidance that may be promoted by strategies focused on controlling and altering the emotional response (Hayes,

Villatte, Levin, & Hildebrandt, 2011; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Experiential avoidance refers to an unwillingness to experience, and avoidance of, private states or events, including thoughts, feelings, memories, physical sensations, and behavioral predispositions (Hayes et al., 2004). There is a burgeoning body of evidence supporting the effectiveness of ACT (for a review, see Hayes et al., 2006; Powers et al., 2009; Ruiz, 2010). Some studies have also shown that ACT is equally as effective as traditional CBT in treating a variety of psychopathological presentations, including anxiety and depression (e.g., Arch et al., 2012; Forman et al., 2012). However, there is limited empirical research with ACT for the treatment of PTSD and trauma-related distress. Two books have been published on the use of ACT for trauma-exposed populations and PTSD (Follette & Pistorello, 2007; Walser, Westrup, & Hayes, 2007); however, the peer-reviewed research is sparse. To date, only case studies have been used to empirically illustrate the application of ACT in the treatment of PTSD. Hayes and colleagues (2006) called for "micro studies" to compare the key components of psychotherapies as a complimentary approach to randomized controlled studies. The current project aimed to address the need for a comparison of the effectiveness of the key mechanisms of change in traditional CBT and ACT, cognitive reappraisal and acceptance, respectively, using a trauma analogue design.

Cognitive Reappraisal and Acceptance

Few studies have examined differences between cognitive reappraisal and acceptance on emotional distress. Prior to the start of the current project, only three studies had experimentally compared the effectiveness of these two emotion regulation strategies. Hofmann and colleagues

(2009) investigated the effects of cognitive reappraisal, acceptance, and suppression on the regulation of anxious arousal. Using a sample of undergraduate students (N = 193), participants were instructed to use one of the three strategies to manage their emotions during an impromptu 10-minute speech about controversial topics, which they were told would later be evaluated. Results showed that the reappraisal strategy was more effective for modulating subjective feelings of anxiety than the other two strategies. The acceptance strategy was as effective as reappraisal in regulating physiological arousal, but did not differ from suppression at reducing the subjective feeling of anxiety. Notably, there was no manipulation check and the study did not account for habitual emotion regulation use or any individual differences.

Since the start of the current project, a similar study was published that extended these results by investigating the effects of cognitive reappraisal, acceptance, and distraction on the regulation on anticipatory anxiety (Helbig-Lang, Rusch, Rief, & Lincoln, 2015). Using a clinical sample of participants with social anxiety disorder (n = 67) and healthy controls (n = 72), participants were given instructions to use one of the three strategies to handle anticipatory anxiety prior to giving a videotaped impromptu speech. Participants did not actually give a speech; however, a video camera was placed in front of the participant to evoke the stress response. Participants in this study were given a short manipulation check to assess their implementation of the strategy and perceived success in implementing the strategy. Results of the manipulation check showed that acceptance was associated with lower success ratings than the other strategies within both groups. The researchers noted that the acceptance instructions were derived from mindfulness tasks and suggested that acceptance may require more formal training (Helbig-Lang et al., 2015). Overall, results showed no significant main effect of strategy on self-reported ratings of arousal or psychophysiological parameters. Notably, variance in

anxiety changes was limited, suggesting that the videotape alone may not have been a sufficient stressor to detect the effectiveness of the strategies. Additionally, the study did not account for habitual emotion regulation use or any individual differences.

Szasz and colleagues (2011) also compared the effectiveness of reappraisal, acceptance, and suppression in an experimental task. This study was focused on the effects of these strategies on anger and frustration tolerance. Undergraduate participants (N = 97) were instructed to think of an unresolved situation in which they experienced anger toward another person and then instructed to use reappraisal, acceptance, or suppression prior to a computerized persistence task that served as a behavioral indicator of frustration tolerance. Similar to the results of Hofmann et al. (2009), the investigators found that reappraisal was more effective in reducing anger than the other two strategies, while there was no significant difference between acceptance and suppression on anger. Additionally, participants in the reappraisal condition persisted significantly longer in the frustration tolerance task than participants in the other two conditions. These results suggest that reappraisal strategies may be most beneficial in tolerating situations that have the potential to lead to frustration or anger.

Germain and Kangas (2015) extended this study to account for levels of trait-anger and determine the effect of the strategies on intrusive thoughts at a second time point. A community sample of adults (N = 102) that scored at or above the 75th percentile normal range on a measure of trait anger were recruited to complete a task similar to the one used in Szasz and colleagues (2011) experiment. Participants were recorded recalling and describing a recent anger-provoking event and then instructed to use acceptance, suppression, or reappraisal prior to listening to the recording of the anger recall interview. A manipulation check was used at the end of the session to determine implementation of the strategy. At a second time point, approximately 24 hours

later, the participants completed measures of intrusions and distress related to the anger recall interview. Consistent with the previous studies, the investigators found that participants in the reappraisal condition showed significant reductions in state-anger. Notably, levels of state-anger increased among participants in the acceptance condition. However, there were no differences in state-anger between the conditions at follow up 24 hours later. These results provide further evidence that reappraisal strategies may be more beneficial than acceptance in regulating anger.

One study has directly compared cognitive reappraisal and acceptance strategies that targeted emotions other than anxiety and anger. Wolgast, Lundh, and Viborg (2011) recently studied the effectiveness of these strategies in reducing distress elicited by emotion eliciting film clips. Participants recruited from the community and a university (N = 94) were exposed to a neutral film-clip and three film-clips intended to induce fear (a film clip from the movie "The Ring"), disgust (a scene of a surgical amputation of an arm), and sadness (a film clip from the movie "Return to me"). The film clips varied in length from 90 to 216 seconds. Prior to watching the film clips, participants were given instructions to use cognitive reappraisal, acceptance, or simply watch the film clips carefully. Additionally, participants in the cognitive reappraisal and acceptance conditions were given short rationales for using the strategies. The only significant difference observed between the reappraisal and acceptance condition was in relation to the disgust film clip. Participants reported significantly less negative affect in the reappraisal condition than in the acceptance condition following the disgust film clip. The authors also assessed the habitual use of acceptance and reappraisal; however, including these variables did not change the results of the experimental manipulation. This suggests that participants were able to use the emotion regulation strategies as instructed by the authors. Additionally, the results showed that avoidance behavior (self-reported unwillingness to view the film-clip again) was

significantly positively correlated with negative affect for participants in the cognitive reappraisal condition. This illustrates that participants unsuccessfully attempting to use cognitive reappraisal to reduce negative affect endorsed higher levels of avoidance behavior than individuals with lower levels of negative affect in the cognitive reappraisal condition. This relationship was not significant in the acceptance condition, suggesting that there was no connection between levels of avoidance behavior and negative affect among individuals in the acceptance condition. These results support the notion that acceptance may reduce the degree to which experiential avoidance affects behavior. The results of Wolgast et al. (2011) differ from the two prior studies that clearly pointed to differences in the effectiveness between the two strategies. Additional research comparing these two strategies is warranted to clarify whether one strategy is more effective than the other, or whether they are equally effective at reducing emotional distress and avoidance tendencies.

The aforementioned studies comparing cognitive reappraisal and acceptance are limited in several ways. First, only one study accounted for habitual emotion regulation strategies. Second, none of the studies used a trauma analogue design in order to examine the effectiveness of these strategies in regard to trauma-related distress. Additionally, none of these studies took into account current symptoms of psychopathology. Given the relationship between emotion regulation difficulties and psychopathology, it is likely that individuals with higher levels of psychopathology may have greater difficulty employing emotion regulation strategies during the experiment. In particular, although Wolgast et al. (2011) measured avoidance tendencies in relation to the film-clip, avoidance is also a core symptom of PTSD. Thus, controlling for current symptoms of psychopathology would allow for greater clarification in varied effectiveness between emotion regulation strategies. Lastly, none of these studies examined the role of

individual differences that may impact the effectiveness of these strategies in reducing distress. Additional research was warranted to address these gaps and explore the role of individual differences that may influence the effectiveness of emotion regulation strategies, specifically one that has recently been highlighted in the trauma literature: attentional control.

The current study aimed to replicate and extend the findings of these studies. In particular, participants were provided with instructions adapted from Wolgast et al. (2011) to use cognitive reappraisal or acceptance while watching a distressing film clip that depicted a motor vehicle accident with fatalities. Of note, participants were able to practice using these strategies during a less distressing training film in order to ensure understanding and implementation of the appropriate strategy. As an extension of the previous work, this study accounted for habitual emotion regulation strategies, current posttraumatic stress symptoms, and related risk factors (e.g., trauma history). Finally, attentional control was examined as an individual difference factor that may enhance or deter from the effectiveness of participants' assigned emotion regulation strategy (reappraisal or acceptance).

The Role of Individual Differences in Attention

Given the advantages of cognitive reappraisal and acceptance in treatments for trauma-related distress, it is important to understand the intervening factors that impact the effectiveness of these strategies. Importantly, there exists a wide range of individual differences in executive control abilities that may impact the effectiveness of emotion regulation strategies (Ochsner & Gross, 2007). Gross' (1998, 2014) original process model of emotion regulation highlighted the ability to flexibly control and deploy attention as a gateway to implementing cognitive change

and response modulation strategies. Attention deployment remains influential to emotion regulation within the revised model (i.e. the EPM; Gross, 2015a). As research has shown that attentional control can be enhanced through training (e.g., Chiesa, Calati, & Serretti, 2011; Morrison & Chein, 2011), an understanding of the impact of attentional control on the effectiveness of cognitive reappraisal and acceptance in reducing distress may have important clinical implications for treating trauma-related pathology. avoidance and PTSD (e.g., Pineles et al., 2011).

Attentional Control

Attention and attentional control has been described as consisting of a set of brain networks: the alerting network, orienting network, and executive network (Petersen & Posner, 2012; Posner & Petersen, 1990). The alerting network is focused on producing and maintaining vigilance to a stimulus and one's performance during a task. The orienting network is focused on selecting specific information and shifting attention. The executive network focuses on processing and awareness, in particular monitoring conflicts in the areas of cognition and emotion. While these networks are largely uncorrelated and distinct (Fan, McCandliss, Sommer, Raz, & Posner, 2002; Rueda, Posner, & Rothbart, 2011), research suggests that they work together (Fan et al., 2009; Posner & Rothbart, 2007). In particular, studies have shown that the orienting network interacts with the executive network and can enhance or interfere with conflict resolution (Callejas, Lupianez, Funes, & Tudela, 2005; Fan et al., 2009). Notably, individual differences have been shown in the efficiency of each of the networks (Fan et al., 2002; Posner & Rothbart, 2007). For the purposes of this study, particular emphasis will be placed on the

orienting network, as it appears to serve functions consistent with the attentional deployment strategies highlighted in Gross' (1998a, 2014) process model of emotion regulation.

The orienting network involves three mental operations: 1) disengaging from one focus of attention, 2) moving to a new focus of attention, and 3) engaging the new focus of attention (Posner, 1980; Posner, Walker, Friedrich, & Rafal, 1984). Of note, these operations are not completely independent of each other (Posner, 1980). Posner and colleagues studied these mental operations using an experimental reaction time task (Posner, Cohen, & Rafal, 1982; Posner et al., 1984). During the task, participants viewed a screen with a fixation cross in the middle of two boxes. Then, a cue (e.g., a brightening of one of the boxes) appears in one of the two boxes. Finally, a probe (e.g., asterisk) appears in one of the boxes. If the cue is given in the same position as the target probe (i.e., "valid trials"), then the only required mental operation is to engage the target when it appears. If the cue is given in the box opposite the target probe (i.e., "invalid trials"), the participant must disengage attention from the cued box, shift attention to the other target, and engage the new target. If no cue is given (i.e., "uncued trials"), attention must be shifted to the target and engaged. Posner and colleagues (1984) argued that participants who are faster at responding to the target following a valid trial than an invalid trial may have difficulty disengaging from the cue and shifting attention to the target.

Research has also shown that attentional processes, such as disengagement and shifting, are moderated by the affective or emotional valence of stimuli (for a review, Vuilleumier, 2005; Vuilleumier & Huang, 2009). Although detection times are faster with emotional stimuli in comparison to neutral stimuli, emotional stimuli are often shown to delay performance of the orienting network's disengagement and shifting of attention (e.g., Fox, Russo, & Dutton, 2002). Vuilleumier (2005) suggests that emotional stimuli capture greater attention than neutral stimuli

do, thus interfering with disengagement and shifting processes. For example, Fox, Russo, and Dutton (2002) used Posner and colleague's (1984) paradigm to investigate whether emotional stimuli modulate attentional processes. Fox and colleagues (2002) modified the paradigm to use emotional faces (i.e., angry or happy) and neutral faces as the cues. Participants in this study took longer to respond to emotional stimuli than neutral stimuli during the invalid trials (Fox et al., 2002). Similar research in trauma populations has shown that attentional processes are affected by the emotional valence of stimuli, particularly trauma-related stimuli (Pineles, Shipherd, Welch, & Yovel, 2007; Pineles, Shipherd, Mostoufi, Abramovitz, & Yovel, 2009).

Attentional Control and Trauma

Two studies examining attentional control abilities among populations with high posttraumatic stress symptomatology demonstrate that the orienting network among trauma-exposed populations is modulated by emotionally arousing trauma-relevant stimuli. Pineles, Shipherd, Welch, and Yovel (2007) examined the ability to disengage attention from threatening, Vietnam-related stimuli among Vietnam-era veterans. Participants (N = 57) completed a computerized visual search task in which they were asked to identify an "odd-ball" or discrepant word target among a group of identical stimuli. The target was either a threat word (e.g., ambush) or a neutral word (e.g., cotton) among letter strings (e.g., kdvel). Participants high in posttraumatic stress symptoms were slower to identify neutral words among a group of threat words than participants low in posttraumatic stress symptoms. These results were replicated in a sample of sexual assault survivors (N = 46) incorporating both general threat words (e.g., tumor) and sexual assault related words (e.g., rape; Pineles, Shipherd, Mostoufi, Abramovitz, & Yovel,

2009). Participants with high posttraumatic stress symptoms exhibited the same attentional difficulties as in the previous study, with greater difficulty disengaging from sexual assault related words to identify neutral words. These results highlight the aforementioned notion that attentional processes may be modulated by the affective or emotional valence of stimuli, particularly trauma-related stimuli. It is notable that the threat-related words were not chosen based on the valence of the word but were rated as having a high "threat value" by anxious participants and a nonclinical control group in a prior study. It may be that these threat words did not evoke similar negative emotions as the trauma-related stimuli. The current study attempted to further these findings by using emotionally valenced words that elicited negative emotions, as well as trauma-related stimuli, in a task similar to Posner and colleagues' (1984) paradigm to measure attentional control ability, specifically the ability to disengage and shift attention.

One trauma-relevant study that used a task similar to Posner and colleagues' (1984) paradigm to examine attentional processes employed a dot-probe task (Bardeen & Orcutt, 2011). The dot-probe task has often been used to study the orienting network among anxious populations (e.g., Koster, Crombez, Verschuere, & De Houwer, 2004; Mogg, Holmes, Garner, & Bradley, 2008; Salemink, van den Hout, & Kindt, 2007). Typically, during this task, two stimuli (e.g., emotional word and neutral word) are presented side by side on a computer screen. Both stimuli remain on the screen for a specified duration of time (e.g., 500ms), and then one of the stimuli is replaced by a probe (e.g., a dot). Participants are instructed to respond as quickly as possible to the probe. Similar to Posner and colleagues' (1984) paradigm, slower responses to probes replacing neutral stimuli, when an emotional stimuli is in the other location, compared to when a neutral stimuli is in the other location, illustrates difficulty disengaging from emotional stimuli. For example, Salemink et al. (2007) used threat words (e.g., death) and neutral words.

The words were paired in two ways: threat-neutral and neutral-neutral. Following the threat-neutral word pair, a single dot could appear in either position after 500ms. Results showed that high anxious individuals compared to low anxious individuals (based upon a trait measure of anxiety) responded slower to threat-neutral trails in which the dot appears after the neutral word in comparison to neutral-neutral trials. These findings indicate that high anxious individuals had difficulties disengaging from threat (Salemink et al., 2007).

Bardeen and Orcutt (2011) used the dot-probe paradigm to examine difficulties disengaging from threat stimuli among individuals with high and low levels of posttraumatic stress symptoms. Undergraduate participants (N = 97) completed a dot-probe task that used general threat images (e.g., man with knife) aimed at eliciting negative emotion and neutral images (e.g., spoon on table). However, in this study, the authors were investigating attentional bias to threat and examined the difference in reaction times when the probe occurred in the position of the threat image compared to when it occurred in the position of the neutral image during the threat-neutral trials. Using a duration of 500ms, results showed that higher posttraumatic stress symptoms were associated with greater attention to threat stimuli. Although these results may support that individuals higher in posttraumatic stress had greater difficulty disengaging from threat stimuli than participants low in posttraumatic stress, the findings would be more conclusive if compared to the neutral-neutral trials. Additionally, the stimuli used may have elicited different responses if they were relevant to a particular trauma such as in Pineles and colleagues' (2007, 2009) studies. The current study used a similar dot-probe task incorporating stimuli that elicit negative emotions as well as trauma-related stimuli.

Research regarding the role of attentional processes following trauma has focused mainly on the impact of overall attentional control on symptoms following exposure to trauma. For

example, Bardeen and Read (2010) examined the association between attentional control, posttraumatic stress symptoms, and negative affect that was induced by a trauma re-telling. Undergraduate participants (N = 49) completed self-report measures of affect prior to and at two times points following an interview in which they were asked to describe their three most distressing life events in as much detail as possible. Attentional control and posttraumatic stress symptoms were also assessed using self-report measures. Results showed that greater attentional control predicted quicker recovery from trauma-elicited negative mood following the trauma re-telling. Further, the investigators found a small effect of high posttraumatic stress on the ability to employ attentional control to reduce distress. Of note, the authors did not investigate emotion regulation difficulties or provide specific instructions for how to regulate emotion during the task.

A recent prospective study illustrated that attentional control may be a protective factor against the development of posttraumatic stress symptoms (Bardeen, Fergus, & Orcutt, 2014). Undergraduate participants (N = 85) attended two assessment sessions with an average interim of 36.9 days. Attentional control and posttraumatic stress symptoms were assessed with self-report measures. Results showed a negative association between attentional control and posttraumatic stress symptoms at the second time point only for participants who had experienced additional trauma between the assessment sessions. These results suggest that the ability to disengage and shift attention serves as a buffer against elevated posttraumatic stress symptoms following trauma exposure. However, this study was limited by the use of self-report measures to assess attentional control and future research would benefit from the use of an experimental design to illustrate the importance of attentional control over time in relation to traumatic stress. The current study sought to address this gap by using an experimental design with the dot-probe task

at three time points to also ascertain the stability of attentional control abilities.

Studies that have used experimental designs have mainly focused on the re-experiencing symptoms of PTSD, specifically intrusions. In one recent trauma analogue study, participants completed an attentional control task that assessed proactive interference, which can be used to assess the ability to inhibit information that was previously relevant (Verwoerd, Wessel, de Jong, Nieuwenhuis, & Huntjens, 2011). Participants studied two lists of words with shared and non-shared categories. Participants were then shown words from one list and asked to recall as many as possible. Participants were then shown words from the other list and asked to recall as many words as possible again, without repeating words from the first list. These participants then watched a film-clip of a murder scene that showed graphic images and completed distress ratings. Participants were also given a diary to record any film-related intrusions, including images, thoughts, and emotions, as well as the distress they experienced for each intrusive memory. Participants were asked to fill this diary out daily for seven days and then completed a self-report measure of intrusions related to the film as well as current distress. Results showed that more difficulty with proactive interference was related to more intrusive thoughts following the film (Verwoerd et al., 2011). This is consistent with previously noted research indicating that lower attentional control abilities are associated with higher posttraumatic stress symptoms. While valuable, Verwoerd and colleagues (2011) research has only examined one facet of attentional control; namely, the capacity to focus attention even when there are distractions and competing tasks. To date, no research has examined the relationship between intrusive memories and another important facet of attentional control, the capacity to disengage and shift attention. The current study aimed to extend these findings to investigate the role of the ability to shift attention on intrusive memories in an experimental design. Similarly, participants were asked to

complete an intrusions diary for seven days and then complete a self-report measure of intrusions to determine the extent to which one's ability to disengage and shift attention predicts the amount of intrusive symptoms experienced following a distressing film.

Attentional Control and Emotion Regulation

A recent study examined the impact of attentional control on reappraisal ability using a sad film clip to induce distress (Malooly, Genet, & Siemer, 2013). In this study, the authors focused on the ability to attend to and disengage from emotional material, which they termed affective flexibility. Participants (N = 149) completed two task-switching paradigms to assess ability to flexibly attend to and disengage from nonemotional and emotional material. The first paradigm required participants to categorize numbers based on a presented rule that alternated randomly. The second paradigm required participants to sort emotional pictures based on either an emotional rule (to sort them based on the emotional valence as positive or negative) or a nonemotional rule (to sort them based on how many humans were shown in the picture). All participants then viewed a sad film clip with instructions to use reappraisal or simply to experience any emotions (i.e., the control condition). The ability to disengage from the nonemotional material was not significantly associated with distress or changes in distress in either condition. However, less difficulty disengaging from negative emotional images in order to categorize them using a nonemotional rule predicted more effective reappraisal use (i.e., lower sadness ratings). This indicates that less difficulty focusing on neutral aspects of a negative image was associated with lower sadness ratings. Additionally, less difficulty categorizing a positive image using the emotional rule predicted more effective reappraisal use, indicating that

less difficulty focusing on the emotional aspects of positively valenced pictures predicted greater reappraisal ability.

Malooly and colleagues' (2013) study points to the importance of attentional control in the effective use of emotion regulation. The results from this study further emphasize that attentional control abilities differ when considered in regard to emotional material versus nonemotional material. Measures of attentional control in regard to emotional material appear to be better predictors of the effectiveness of emotion regulation strategies in comparison to measures focused on nonemotional material. The current study attempted to expand upon these findings by using emotional stimuli as well as trauma-related stimuli. Malooly and colleagues' (2013) study only focused on sad affect, which was induced by a short, standardized film clip, and may not generalize to trauma-related distress. Additionally, this study did not take into account current psychopathology or symptoms that may alter attentional control or emotion regulation abilities, such as posttraumatic stress symptoms (e.g. Mogg & Bradley, 2005). Moreover, this study only focused on reappraisal ability and warrants future research on the impact of attentional control on other emotion regulation strategies. The current study aimed to address these gaps by taking into account current posttraumatic stress symptoms and focusing on the impact of attentional control on the effectiveness of the strategies of reappraisal and acceptance in reducing trauma-related symptomatology (i.e., distress, avoidance, and intrusions).

Pe and colleagues (2013) examined a form of attentional control, called interference resolution, on the use of reappraisal or rumination to reduce the stress of daily life experiences. Undergraduate participants (N = 95) completed an initial affective interference task to examine differences in individual ability to inhibit previously relevant information in order to attend to and process new information. Participants were given a palmtop computer that beeped 10 times a

day for seven consecutive days to assess present positive and negative affect, as well as the use of reappraisal or rumination throughout the day. Single item questions were used to determine if reappraisal or rumination were used since the last beep. Results showed that differences in interference resolution ability moderated the impact of rumination and reappraisal on affectivity; namely, participants who had difficulty inhibiting previously negative information experienced greater increases in negative affect when ruminating. Moreover, participants with this difficulty showed smaller decreases in negative affect, as well as smaller increases in positive affect, when engaged in reappraisal.

Pe et al.'s (2013) study highlights the importance of assessing the role of attentional control ability in predicting the effectiveness of different emotion regulation strategies. Difficulties inhibiting previously relevant negative information exacerbated the effects of rumination and limited the benefits of cognitive reappraisal during daily life experiences. This is particularly relevant to populations exposed to trauma, as they may have difficulty inhibiting previously negative or threatening information, which may facilitate depressive symptoms given the prolonged focus on negative information, and posttraumatic stress symptoms such as hypervigilance given the focus on threatening information in the environment. Importantly, participants in this study were not given specific instructions on how to use either rumination or cognitive reappraisal. This study warrants additional research on the effects of this type of attentional control ability when participants are given specific instructions on how to use emotion regulation strategies. Moreover, this study focused on daily life experiences rather than distress caused by a specific stressor. The current study sought to determine the effects of using these strategies to reduce distress caused by a specific stressor. Further, the current study was focused on distress in a trauma analogue design and provided participants with instructions on

how to use the emotion regulation strategies.

Summary of Limitations of Current Research and Future Directions

Gross' (1998a, 2014) original process model emphasizes the various elements of emotion regulation that can modify an ongoing or anticipated emotional response. It is well known that difficulties with emotion regulation can contribute to a multitude of mental health disorders. Of note, PTSD has been linked to several difficulties with emotion regulation. These difficulties are addressed through treatment using strategies such as cognitive reappraisal and acceptance. According to Gross' (1998a, 2014) process model, these two strategies belong to two different emotion regulation families and occur at differing time points. Despite the limitations of dividing strategies into antecedent- and response-focused, strategies that occur early on in the emotion generative process (i.e., antecedent-focused strategies such as cognitive reappraisal) are typically thought of as more effective in reducing distress than strategies that occur following the development of the emotional response (i.e., response-focused strategies such as acceptance). However, no research has directly compared these two strategies using a trauma analogue design. Lastly, none of these studies examined the role of individual differences that may impact the effectiveness of these strategies in reducing distress.

Given that Gross' (1998a, 2014) original process model of emotion regulation highlights the ability to control and deploy attention in a flexible manner as a gateway to implementing cognitive reappraisal and acceptance, an understanding of the impact of individual differences in attentional control abilities on these strategies is warranted. Current research has shown that the ability to disengage and shift attention is associated with quicker recovery from trauma-elicited

negative mood and lower posttraumatic stress symptoms. Although this research is important in illustrating the relevance of attentional control in trauma recovery efforts, to date, no research has examined the impact of this individual difference on specific strategies used to recover from trauma. Studies have shown that difficulties inhibiting previously relevant negative information exacerbated the effects of rumination and limited the benefits of cognitive reappraisal during daily life experiences and after a sad film. These studies were limited by differences in the instructions given to use cognitive reappraisal, a focus on only sad affect or affect from daily life stress, and no assessment of current symptoms of psychopathology.

The Current Study

The aim of the current study was to compare the effectiveness of cognitive reappraisal and acceptance on reducing distress, avoidance, and intrusions using a trauma analogue design. Trauma history and posttraumatic stress symptoms were included as potential covariates, as these variables may serve as risk factors for poor emotion regulation skills. Additionally, this study examined the impact of individual differences in attentional control, particularly the ability to disengage from previously relevant information and shift attention toward new information, on the effectiveness of emotion regulation strategies at reducing negative affect, avoidance, and intrusions following exposure to a stressful film.

Hypotheses

H1a. Current research and clinical practices implicate cognitive reappraisal as an effective strategy to reduce trauma related distress during CBT for PTSD (Foa, Keane, Friedman, & Cohen, 2008; Resick et al., 2008). Although the use of acceptance in ACT has been shown to be effective in treating a variety of psychopathology, there is limited empirical research on the use of acceptance for trauma-exposed populations. While few studies have examined differences between cognitive reappraisal and acceptance, current research points to the reappraisal strategy as more effective for modulating subjective feelings of distress in comparison to acceptance (Hoffman et al., 2009; Szasz et al., 2011; Wolgast et al., 2011). Thus far, studies that have shown these differences have only assessed the effectiveness of these strategies in reducing anxiety, anger, or frustration, and not distress level. Consistent with this research, it is predicted that individuals instructed to use cognitive reappraisal will report smaller increases in levels of negative affect from baseline immediately following a short film clip of a motor vehicle accident than individuals in the acceptance condition.

H1b. Recent research on the importance of attentional control in the effective use of emotion regulation has shown that lower levels of attentional control are related to higher levels of negative affect following a film-clip or caused by daily life stress (Malooly et al., 2013; Pe et al., 2013). However, no research has examined the impact of this individual difference on the effectiveness of cognitive reappraisal and/or acceptance in recovering from trauma related distress. Additionally, this research is limited by the use of tasks that use images or focus on interference rather than a task

that focuses on disengagement from stimuli. The dot-probe task was used to assess attentional control ability, specifically the ability to disengage and shift attention, using neutral, negatively valenced, and motor vehicle accident relevant (i.e., trauma-related) terms. It is predicted that individuals with low attention shifting abilities, as evidenced by greater difficulty disengaging from negatively valenced and motor vehicle accident relevant terms prior to watching a film clip of a motor vehicle accident, will report greater increases in levels of negative affect from baseline immediately following the short film clip than individuals with high attention shifting abilities across both conditions.

H2a. Given the limited research comparing reappraisal and acceptance, and the current research indicating cognitive reappraisal as more effective in reducing emotional reactions than acceptance (e.g., Hoffman et al., 2009; Szasz et al., 2011; Wolgast et al., 2011), it is predicted that individuals instructed to use cognitive reappraisal will report lower levels of intrusive thoughts throughout the week following a short film clip of a motor vehicle accident than individuals in the acceptance condition.

H2b. Higher levels of attentional control have been found to be a protective factor against posttraumatic stress symptoms (i.e., intrusive thoughts and avoidance; Bardeen et al., 2014). In particular, higher levels of attentional control have predicted quicker recovery from trauma-elicited negative mood (Bardeen & Read, 2010). Research that has employed an experimental design to test this relationship has focused on the impact of one facet of attentional control on intrusive thoughts following distressing films. This research has shown that greater capacity to focus attention even where there are distractions is associated with lower levels of film-related intrusions

(Verwoerd et al., 2011). However, no research has examined the impact of the capacity to shift attention on intrusive thoughts. It is predicted that individuals with low attention shifting abilities, as evidenced by greater difficulty disengaging from negatively valenced and motor vehicle accident relevant terms prior to watching a film clip of a motor vehicle accident, will report higher levels of intrusive thoughts throughout the week following the short film clip than individuals with high attention shifting abilities across both conditions.

H3a. While reappraisal has been shown to be more effective for reducing subjective feelings of distress, there is less evidence to suggest that it is more effective in reducing behavioral avoidance. In fact, it has been suggested that acceptance specifically targets experiential avoidance (Hayes et al., 2011; Hayes et al., 1996). Acceptance differs from cognitive reappraisal in that it focuses on allowing the emotion response to proceed naturally instead of attempting to alter or suppress the emotional response (Hayes et al., 2011). Thus, it is predicted that individuals instructed to use acceptance will report lower levels of avoidance immediately following a short film clip of a motor vehicle accident than individuals in the cognitive reappraisal condition.

H3b. Avoidance is a core feature of posttraumatic stress (APA, 2014). Given the relationship between attentional control and posttraumatic stress symptoms (Bardeen et al., 2014), it is predicted that individuals with low attention shifting abilities, as evidenced by greater difficulty disengaging from negatively valenced and motor vehicle accident relevant terms, will report higher levels of avoidance immediately following a short film clip of a motor vehicle accident than individuals with high

attention shifting abilities across both conditions.

Research Questions

RQ1. Will there be an interaction between attentional shifting ability and emotion regulation strategy in predicting distress (e.g. negative affect)? Specifically, does low attentional shifting ability predict distress differently as a function of assigned emotion regulation strategy?

RQ2. Will there be significant differences in trauma-related attention shifting ability across conditions a week after viewing a short film clip of a motor vehicle accident? Specifically, if there are longitudinal differences in difficulty disengaging from trauma-relevant terms, will these differences vary as a function of assigned emotion regulation strategy?

CHAPTER 2

PROJECT METHODS

Participants

In total, 226 participants attended the first session. Of these participants, 54 were excluded due to self-reported experiences of severe motor vehicle accidents (*n* = 48, 21.2%) or failed manipulation checks (*n* = 6, 2.7%). An additional 19 (8.4%) participants were excluded due to reporting a total PTSD symptom severity score of 37 or above (median: 44, range 38-65). The final sample included 153 participants who completed the first session and 113 participants who completed both sessions.

The average age of participants in the full sample was 19.68 (*SD* = 2.55), which ranged from 17 to 47. There was an approximately even number of males and females, with 50% of participants identifying as female (*n* = 113). The majority of participants identified as Caucasian (Non-Hispanic) (40.7%; *n* = 92), African American (31.4%; *n* = 71), or Hispanic (12.4%; *n* = 28); 4.9% identified as Asian-American/Pacific Islander (*n* = 11), 2.7% identified as multiethnic (*n* = 6), 6.2% identified as another race or ethnicity (*n* = 14) and four participants declined to answer. Most participants were single (i.e., never married; 71.7%, *n* = 162) or in a relationship, not married, not living together (20.8%, *n* = 47). The majority of participants reported no previous experience with counseling or therapy (72.6%, *n* = 164). Participants reported experiencing an average of 8.98 (*SD* = 10.36) total traumatic events.

The average age of participants in the final sample was 19.28 (*SD* = 1.49), which ranged

from 17 to 28. The majority of participants identified as female (51.6%, n = 79) and Caucasian (Non-Hispanic) (45.8%; n = 70), African American (26.1%; n = 40), or Hispanic (11.8%; n = 18); 5.9% identified as Asian-American/Pacific Islander (n = 9), 3.9% identified as multiethnic (n = 6), 5.2% identified as another race or ethnicity (n = 8) and two participants declined to answer. Most participants were single (i.e., never married; 73.2%, n = 112) or in a relationship, not married, not living together (20.3%, n = 31). The majority of participants reported no previous experience with counseling or therapy (73.9%, n = 113). Participants reported experiencing an average of 6.9 (SD = 7.63) total traumatic events.

The final sample was significantly different from the excluded participants in the full sample with regard to age, $t(223) = 3.514$, $p = .001$, ethnicity, ($\chi^2(5, N = 222) = 11.931$, $p = .036$), and trauma history, $t(224) = 4.558$, $p < .001$. Participants who were excluded were older (M = 20.52; SD = 3.8) than participants in the final sample. Participants who identified as Caucasian (Non-Hispanic) were more likely to be included in the final sample than excluded, and no participants who identified as multiethnic were excluded. Participants who were excluded also experienced a higher frequency of traumatic events (M = 13.34, SD = 13.6) than participants who were included in the final sample (M = 6.9, SD = 7.63). The final sample did not differ from the excluded participants with regard to sex ($\chi^2(1, N = 224) = .649$, $p = .420$), relationship status ($\chi^2(3, N = 224) = 1.769$, $p = .622$), or whether they had previously attended therapy for mental health issues ($\chi^2(1, N = 226) = .396$, $p = .529$).

Participants who completed both sessions were significantly different from participants who only completed the first session with regard to ethnicity, ($\chi^2(5, N = 152) = 12.724$, $p = .026$) and trauma history, $t(151) = 1.985$, $p = .049$. Participants who identified as Caucasian (Non-Hispanic) were more likely to complete both sessions, and no participants who identified as

Asian-American/Pacific Islander only completed the first session. Participants who did not complete part two experienced a higher frequency of traumatic events (M = 9.2, SD = 10.64) than participants who completed both sessions (M = 6.1, SD = 6.1). Participants who completed both sessions did not differ from participants who only completed the first session with regard to age ($t(150) = .978$, $p = .330$), sex (χ^2 (1, N = 151) = .586, p = .444), relationship status ($\chi^2(3, N = 151) = .783$, p = .853), whether they had previously attended therapy for mental health issues (χ^2 (1, N = 153) = .417, p = .518), or PTSD symptoms, ($t(151) = 1.025$, $p = .307$).

Measures

Demographics

A demographic questionnaire created by the PI was used to assess age, sex, ethnicity (Hispanic or Latino, Not Hispanic or Latino), race (Caucasian or White, African American, Asian, American Indian or Alaskan Native, Native Hawaiian/other Pacific Islander, Biracial, Unknown), and previous experience in therapy.

Habitual Emotion Regulation

Habitual emotion regulation use was assessed to test the equivalence of groups to ensure that random assignment was successful. Consistent with Wolgast et al. (2011), two measures were included to control for habitual use of cognitive reappraisal and acceptance. The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) is a 10-item questionnaire that consists of

two subscales: cognitive reappraisal (e.g., *I control my emotions by changing the way I think about the situation I'm in*) and expressive suppression (e.g., *I keep my feelings to myself*). Participants rated each item on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The ERQ has shown good psychometric properties among undergraduate samples, as demonstrated by good reliability and convergent validity with other measures of regulation (Gross & John, 2003). Internal consistencies averaged .79 and .73 for cognitive reappraisal and suppression scales, respectively. Test-retest reliability over a 3-month interval was .69 for both scales. Cognitive reappraisal was also related to coping through reinterpretation (β = .43) while suppression was inversely related to coping through venting (β = -.43), providing evidence that participants who typically use reappraisal are more likely to find a different way of viewing stressful events whereas people who typically use suppression and less likely to express their emotions (Gross & John, 2003). For the purpose of the current study, only the cognitive reappraisal subscale was used to assess for habitual tendencies to use this specific emotion regulation strategy. The cognitive reappraisal subscale demonstrated acceptable internal consistency in the current study (α = .83).

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was used to control for habitual use of acceptance strategies. The 36-item questionnaire consists of six subscales to assess different components of emotion regulation: non-acceptance (e.g., *When I'm upset, I become angry with myself for feeling that way*); impulsivity (e.g., *When I'm upset, I lose control over my behaviors*); awareness (e.g., *I pay attention to how I feel*; reverse coded); strategies (e.g., *When I'm upset, I believe that wallowing in it is all I can do*); and clarity (e.g., *I have no idea how I am feeling*). Participants rated each item using the following response options: Almost never (*0 - 10%),* Sometimes (*11 - 35%*), About half the time (*36 - 65%*), Most

of the time (*66 - 90%*), and Almost always (*91 - 100%*). Subscale scores were calculated by averaging the responses to each item within each subscale. Higher scores reflect greater difficulties in the ability to regulate emotions. In the original development of the scale, high internal consistency was reported; with the exception of the clarity subscale ($\alpha = .71$), all subscales had an internal consistency at or above .82. For the current study, only the non-acceptance subscale (reverse scored) was used to assess for the tendency to use acceptance strategies. The acceptance subscale demonstrated acceptable internal consistency in the current study ($\alpha = .90$).

Trauma History

Trauma history was explored to test the equivalence of groups and ensure that random assignment was successful. The Traumatic Life Events Questionnaire (TLEQ; Kubany, 2004) is a 23-item measure that was used to assess lifetime exposure to a broad range of potentially traumatic events. The TLEQ includes 22 separate potentially traumatic events, such as natural disasters, motor vehicle accidents, war/combat, sexual assault, and physical assault. The 23rd item represents "other events" with examples (e.g., kidnapping). In accordance with the revision to the trauma criterion in *DSM - 5* (APA, 2013), one item was revised for the current study. The item assessing exposure to the sudden and unexpected death of a close friend or a loved one was revised to specify that the death was due to violence or an accident. The item assessing exposure to severe motor vehicle accidents was used to exclude participants. There are six response choices for each item: *never*, *once, twice, 3 times*, *4 times*, *5 times*, and *more than 5 times*. A total trauma history score was created by summing all of the items, with higher scores indicating

greater frequency of exposure to trauma (Kubany, 2000). If participants endorsed exposure to a potentially traumatic event, they were asked follow-up questions about their reaction to the event (e.g., *Did you experience intense fear, helplessness, or horror when it happened?*).

The TLEQ possesses good psychometric properties, as demonstrated by good test-retest reliability and positive predictive power (Kubany, 2004). In the original development of the questionnaire, findings indicated good temporal stability over a two-week period, with an average kappa coefficient of .63 (kappa coefficients above .40 for 20 items and .60 or above for 12 items; Kubany, 2004). Additionally, the percentage of occurrence agreements, in which participants endorsed experiencing a traumatic event at both time points, ranged from 50% to 100% and averaged 81%. The percentage of nonoccurrence agreements, in which participants did not endorse experiencing a traumatic event at both time points, ranged from 25% to 100% and average 82%. The average overall percentage of test-retest agreements was 86% (Kubany, 2004).

The TLEQ has also been shown to identify more potentially traumatic events than the Structured Clinical Interview for the Diagnostic and Statistical Manual - Fourth Edition (SCID; First, Spitzer, Gibbon, & Williams, 1998) as it assesses exposure to a broader range of traumatic events. The TLEQ produced a 9-fold higher rate of traumatic event identification in a clinical population at risk for PTSD, indicating that nine times as many potentially traumatic events were reported using the TLEQ versus the SCID (Pierce, Burke, Stoller, Neufeld, & Brooner, 2009). The TLEQ has also been shown to have positive predictive power. When used in a sample of women identified as having PTSD, 98% endorsed experiencing a traumatic event and intense fear, helplessness, or horror on the TLEQ (Kubany et al., 2000).

Posttraumatic Stress Symptoms

Posttraumatic stress symptoms were assessed to ensure equivalence across conditions. Further, PTSD symptoms suggestive of probable PTSD served as an exclusionary criterion. The PTSD Checklist for DSM - 5 (PCL-5; Weathers et al., 2013) was used to assess posttraumatic stress symptoms. Participants were instructed to complete the PCL -5 in reference to a potentially traumatic event endorsed on the TLEQ or a stressful experience more generally if they did not endorse any events on the TLEQ. The PCL - 5 is a 20-item self-report questionnaire corresponding to the *DSM - 5* (APA, 2013) symptom criteria for PTSD (e.g., Repeated, disturbing, and unwanted memories of the stressful experience). Participants were asked to rate each item based on how often they were bothered by the item in the past month, ranging from 0 (*not at all*) to 4 (*extremely*). A total posttraumatic stress symptom severity score was created by summing the scores for all of the items. Psychometric evaluations have shown that the PCL - 5 is equivalent to the previously validated PTSD Checklist - Stressor version (PCL-S; Blevins, Weathers, Davis, Witte, & Domino, 2015; Hoge, Riviere, Wilk, Herrell, & Weathers, 2014). As of the beginning of data collection, the optimal PCL - 5 cutoff to provide a provisional PTSD diagnosis appeared to be 38, as PCL-5 scores from 15-38 performed similarly to PCL-S scores of 30-50 in preliminary validation work (Hoge et al., 2014). Results from recent studies examining the psychometric properties of the PCL-5 among college students revealed similar patterns. These findings showed that PCL-5 scores from 28-37 best predicted PCL scores from 40-50 (Blevins et al., 2015). Thus, a PCL-5 score of 37 was used in the current study as an exclusionary criterion. The PCL demonstrated acceptable internal consistency in the current study ($\alpha = .88$).

Attentional Shifting Task

The dot-probe task (Figure 6) was presented on a desktop screen using Eprime 2.0 software (Psychology Software Tools, Pittsburgh, PA). Participants were seated approximately 50 centimeters from the computer monitor during the task. The task incorporated 40 negative – neutral, 40 trauma-related – neutral, and 40 neutral – neutral word pairs. Negative and neutral words were identified for inclusion using the Affective Norms of English Words list (ANEW; Bradley & Lang, 1999) in consultation with the dissertation chair. Consistent with Pe et al. (2013), neutral words had valence ratings between 4 and 6, while negative words had valence ratings between 1 and 4. Trauma – related words were identified by the PI and Chair using the words listed on ANEW. Participants were provided with instructions to press a numeric key ("1" or "2") on the computer keyboard to indicate the position of a dot that would appear on the screen. The instructions emphasized that participants were to respond as quickly and accurately as possible. Each trial began with a fixation cross presented in the center of the desktop screen for 1,000ms. Then, two stimuli appeared side by side on the screen (i.e., neutral – neutral, negative – neutral, or trauma-related – neutral) for 500ms. All words were presented in lowercase, white letters against black background (consistent with Salemink et al., 2007). Participants completed 10 neutral – neutral practice trails and one continuous block of 120 trials (40 of each word pair type). The order of trials was randomized across participants. Participants completed the dot-probe task three times: once prior to viewing the trauma video stimulus, once immediately following the trauma video stimulus, and once approximately one week following the trauma video stimulus. The dot-probe task was typically completed in five minutes or less.

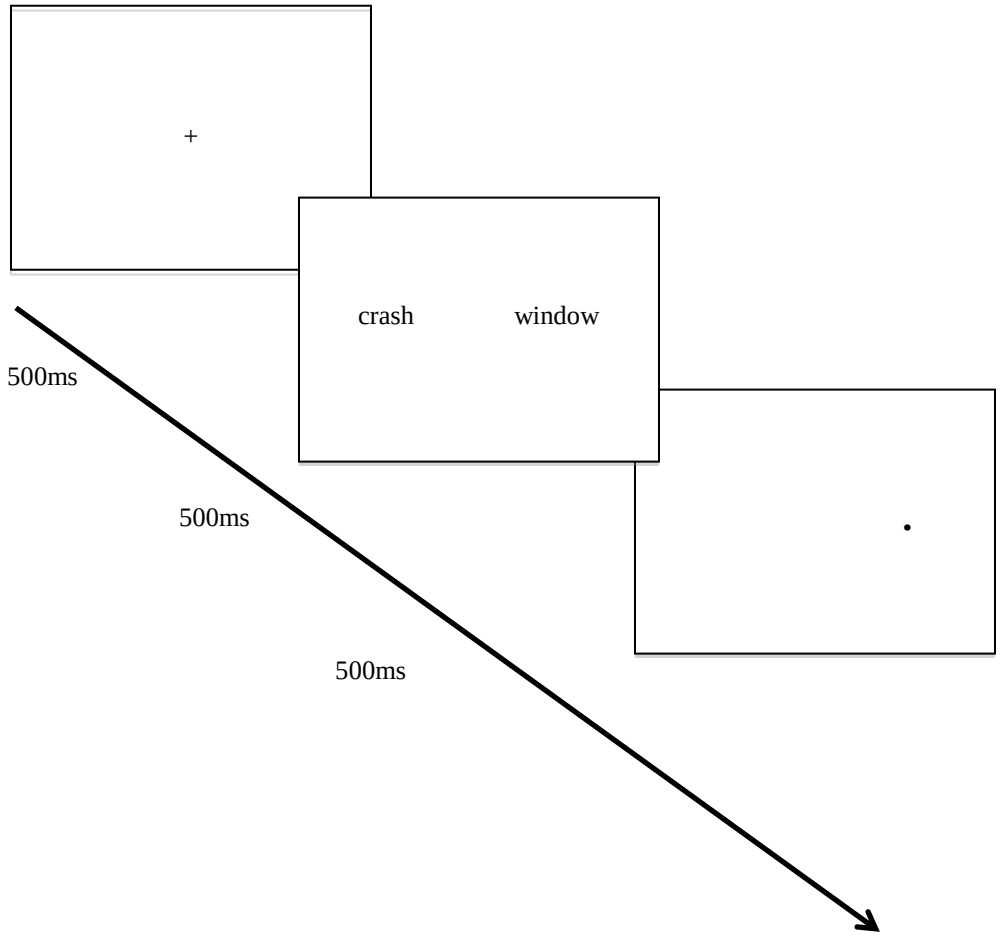

Figure 6. The attentional shifting task. This figure demonstrates the task design, with an example of a trauma-relevant – neutral trial with the dot appearing in the space where the neutral word appeared. Participants who are slower to respond to this dot in comparison to a dot after a neutral-neutral trial are suggested to have difficulties disengaging from trauma-relevant stimuli.

Mood

The Positive and Negative Affect Scale: State Version (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item measure that was used to assess baseline mood prior to watching the film-clips as well as experienced emotion immediately following the film-clips. Prior to watching the film clips, participants were asked to rate the extent to which they presently felt various mood descriptors. Following the film-clips, participants were asked to rate "to what extent did you feel this way while watching the film-clips" for each descriptor. The PANAS assesses two general factors, with 10 items measuring Positive Affect (PA; e.g., interested, excited) and 10 items measuring Negative Affect (NA; e.g., irritable, nervous). Each item is rated on a 5-point scale ranging from 1 (*very slightly or not at all)* to 5 (*extremely).* A total mean score was created by summing all items corresponding to each factor (PA or NA) and then dividing by the number of items on that factor, with higher scores indicating greater affectivity on that dimension. For the purposes of this study, only the NA subscale was used to assess fluctuations in state NA.

The PANAS has been found to have good psychometric properties with each factor demonstrating reliability and validity in student, community, and clinical populations, as well as across variable time frames, from the present moment to past year or general (Watson, Clark, & Tellegen, 1988). The original development of the questionnaire showed that the reliability of both PA and NA scales are good, with internal consistencies ranging from .86 to .90 for PA, and from .84 to .87 for NA across seven time frames. Test-retest reliability after an 8-week time period ranged from .86 to .90 for PA and from .84 to .87 for NA across the various time frames. The correlation between PA and NA scales is low, ranging from -.12 to -.23, indicating that the

two scales only share approximately 1% to 5% of their variance. A recent study formally tested the independence of these two scales using multilevel structural equation modeling and found that PA and NA were inversely correlated at the within-person level, though never reaching r = -1.0, and independent at the between-person level (Rush & Hofer, 2014). This indicates that, while there is a distinction between PA and NA, they can be experienced at the same time.

The PANAS has demonstrated good psychometric properties when used previously to indicate fluctuations in mood and self-reported emotional reactivity to film-clips. Studies have found that experiencing stressors, physical symptoms, and psychological distress are associated with greater levels of NA and lower levels of PA; whereas social activity and physical exercise have been found to be associated with higher levels of PA and lower NA (Rush & Hofer, 2014; Watson, 1988). Moreover, Wolgast et al., (2011) used the PANAS to assess fluctuations in NA following films intended to elicit feelings of disgust, sadness, and fear, and found significant increases from baseline to after viewing the film clips. Internal consistencies were also strong in their study: .84 for PA and .88 for NA. The PANAS has been used often in research as an indicator of emotional reactivity to film clips (e.g., Campbell-Sills et al., 2006; Dunn, Billotti, Murphy, & Dalgleish, 2009; Hofmann et al., 2009; Schaefer, Nils, Sanchez, & Philippot, 2010; Wolgast et al., 2011). In particular, Campbell-Sills et al. (2006) and Dunn et al. (2009) used the PANAS as a repeated measure (i.e., participants completed the PANAS before and after the film-clip) and conducted ANOVA analyses to examine differences in negative affect. The first administration of the PANAS the negative affect subscale demonstrated fair internal consistency (α = .66). The second administration of the PANAS the negative affect subscale also demonstrated acceptable internal consistency (α = .86).

Avoidance

Avoidant tendencies were assessed following the film clip using a four-item questionnaire created for the purposes of this study. Two questions assessed avoidant tendencies during the film. Participants were asked to estimate how often they looked away from the film clip and how often they attempted to disengage from the film. Responses were given on a six-point scale with anchors for 0 (not at all) to 5 (very often). Two questions assessed avoidant tendencies following the film. Participants were asked to rate how willing they would be to be contacted for additional paid experimental research in which they would be asked to view other film clips depicting vehicular accidents, and a second questions that asked a similar question but in regard to film clips that may elicit similar emotional reactions. Questions were rated on a six-point scale (0: "not at all willing" to 5; "very willing"). The responses to these four questions were used to determine the overall amount of avoidance exhibited by participants in both conditions. Standard scores were created for each set of questions. These two scores were averaged to create a full avoidant tendencies composite score. The avoidant tendencies composite demonstrated acceptable internal consistency in the current study ($\alpha = .71$).

Manipulation Check

Following a short training film, and again after the traffic accident safety film, a 2-item measure adapted from a questionnaire designed by Wolgast and colleagues (2011) was used as a manipulation check to assess participants' understanding of the emotion regulation instructions. There were separate 2-item questionnaires for each condition, with one questionnaire to describe

using the acceptance strategy (e.g., While viewing this film I was able to accept my emotional reactions without trying to change or control them) and one questionnaire to describe using the cognitive reappraisal strategy (e.g., While viewing this film, I was able to influence my emotional reactions by considering different ways of thinking about the content of the film.) Participants were asked to rate to what extent they agreed with each statement on a 6-point scale ranging from 0 (*not at all*) to 5 (*very much*).

Video Stimulus

An approximately three-minute excerpt from *A Tale of Two Cities* (FullWarMovies, 2013), a mildly distressing documentary about the aftermath of bombings, served as a training film. This film has been used as a training film prior to a traffic accident film clip in research examining the use of acceptance (Dunn et al., 2009). A five-minute traffic accident safety film served as an analogue trauma. Film clips do not rely on participants' ability to recall previous experiences or imagine emotional scenes and allow for consistency across participants. The film contained distressing scenes of the aftermath of a fictional motor vehicle accident, including graphic scenes of serious injuries and dead bodies. Previous research has effectively used similar distressing film clips in a trauma analogue design in order to induce short-term distress (e.g., Dunn et al., 2009; Olsen & Beck, 2012). The films were projected on a desktop screen.

Intrusions

Participants were asked to complete an electronic diary to record any film related

intrusions for approximately one week following the film consistent with Verwoerd et al. (2011). Intrusions were defined as spontaneously occurring memories of the film (Holmes et al., 2004; Verwoerd et al., 2011). Verbal and written instructions were given to participants to emphasize that each intrusive memory should be recorded as soon as possible and that there is much variation in the amount of intrusive memories people experience following a stressful event. In particular, participants were reminded that there may be days in which they experience no intrusions; however, to still complete the diary indicating the lack of intrusions. They were asked to describe the content of the intrusion, whether there was something that triggered it (yes/no), and to note the trigger if appropriate. Then, participants were asked to indicate whether the intrusion was a) an image; b) a thought; c) a sound; d) a feeling/emotion; or e) something else. Finally, participants were asked to note the amount of distress and vividness they experienced for the intrusion on a visual analogue scale with anchors for 0 (not at all) to 100 (very much). Compliance with the diary was examined by determining the number of days participants completed the electronic intrusions diary. Individuals with a low compliance rate (below 50%) were excluded from analyses. A total intrusion score was created by summing the total number of intrusions reported in the diary over the course of the week, consistent with Verwoerd et al. (2011).

Participants also completed a modified version of The Impact of Event Scale - Revised (IES-R; Weiss & Marmar, 1997) at the second study session. The IES-R was included to examine intrusive thoughts secondarily. The IES-R is a revised version of the original Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979) to include a hyperarousal subscale. The 22-item questionnaire consists of three subscales: intrusions (e.g., *I thought about it when I didn't mean to*); avoidance (e.g., *I tried not to think about it*); hyperarousal (e.g., *I had trouble falling*

asleep). Items were rated on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*). A total score can be created by summing the response to each item while the authors recommend using the average score for the subscales (Weiss & Marmar, 1997). The questionnaire was adapted for the purpose of measuring film-related intrusions in the previous week. For the current study, each item was anchored to the experience of the trauma video stimulus, e.g. "any reminder brought back feelings about the film." This is consistent with previous research that has used the IES to measure responses to emotional films (Holmes et al., 2009; Lang et al., 2009; Verwoerd et al., 2011).

For the purpose of the current study, only the intrusion subscale was used. Research has shown that intrusion scores were highly correlated (r = .69) to the number of intrusions reported in a daily diary following an emotional film (Laposa & Alden, 2006). A review of 23 studies that assessed the psychometric properties of the IES showed good internal consistency (alphas ranging from 0.65 to .92), strong test retest reliability over one week (0.87 and 0.79 for the intrusions and avoidance subscales, respectively) as well as over one year (0.56 and 0.74), and good convergent validity with measures of PTSD (Sundin & Horowitz, 2002). The IES and IES-R have shown good reliability across more recent studies as well, with high levels of internal consistency (alphas ranging from .79-.94; Creamer, Bell, & Failla, 2003; Beck et al., 2008; Sundin & Horowitz, 2002; Weiss & Marmar, 1997). The IES-R also demonstrates good test-retest reliability over a 6-month interval, ranging from .89 to .94 (Weiss & Marmar, 1997). The intrusion subscale demonstrated acceptable internal consistency in the current study (α = .78).

Procedure

Participants were recruited from the Psychology Department student subject pool at Northern Illinois University. Undergraduate students enrolled in the Introductory Psychology class at NIU are required to participate in research at the university. All students enrolled in this course are registered on SONA, a web-based system that enables students to sign up for research studies and researchers to assign students credit for research participation. Participants were required to sign up for two sessions and were allowed to sign up for the second session on a date between six and nine days after the first session. Participation was voluntary and confidential, as only researchers approved by the Institutional Review Board had access to identifying information about participants.

All participants began with the informed consent and were told that they were able to skip questions, end tasks early, and discontinue or withdraw from the study at any time without any negative consequences. As part of the informed consent process, and in order to reduce attrition, participants were reminded of the longitudinal nature of the study and asked to provide an email address or phone number for reminder emails, texts, or phone calls as preferred by the participant. Participants were able to elect to not receive the reminders without any consequences. Participants who did not opt out were sent a reminder via email or text, or received phone call reminders daily for completion of the daily intrusion diary as well as a final reminder of their second session appointment. Upon the conclusion of the informed consent process, participants completed the battery of paper questionnaires described above (i.e. demographic information, measures of habitual emotion regulation, trauma history, and PCL-5). A research assistant scored and reviewed the questionnaires as they were completed.

Participants were discontinued from the study if they indicated a history of severe motor vehicle accidents, defined as a motor vehicle accident in which there were any injuries or death, on the initial questionnaires. Participants were also excluded from the analyses for the present study if they reported a total PTSD symptom severity score of 37 or above (which corresponded to the provisional PTSD diagnosis recommended at the time data collection began; U.S. Department of Veteran Affairs, 2014). These participants were excluded because the trauma stimulus included a motor vehicle accident with fatalities that could have significantly heightened distress for those participants. Additionally, participants coping with a high degree of posttraumatic stress symptoms may have experienced heightened distress while participating in this study. Given that less than 10% of the general population experience clinically significant posttraumatic stress symptoms following exposure to trauma (Kilpatrick et al., 2013), focusing on individuals without PTSD allowed for greater generalizability of the results.

Following the initial battery of questionnaires, participants completed the dot probe task to assess attentional shifting ability (T1). When the dot-probe task was finished, participants completed the PANAS to provide an estimate of baseline negative affect and then were randomly assigned to one of two conditions: "Reappraisal" or "Acceptance". Next, participants were instructed on how to use their emotion regulation strategy. Participants were given verbal instruction as to how to regulate their emotions during a brief film based on their condition. The instructions for the cognitive reappraisal and acceptance conditions included a brief rationale for using the strategy. These instructions were adapted from the instructions used in the Wolgast, Lundh, and Viborg (2011) study and were provided to the PI with permission by Martin Wolgast.

The cognitive reappraisal strategy read as follows: "You will soon watch a brief film on

traffic safety. It is important that you, while carefully watching the film, remain still with your eyes fixed on the screen in front of you. After the film you will be asked to answer a few questions regarding how you felt while watching it. The film you are about to see will elicit different emotional reactions. The emotions you experience are influenced by your thoughts and interpretations of the events as they unfold. While watching the film, try to recognize your thoughts and consider different ways to think about the film or your interpretations of the film." The instructions were 105 words in length.

The acceptance strategy read as follows: "You will soon watch a brief film on traffic safety. It is important that you, while carefully watching the film, remain still with your eyes fixed on the screen in front of you. After the film you will be asked to answer a few questions regarding how you felt while watching it. The film you are about to see will elicit different emotional reactions. When you experience an emotion, please do not try to control, change, or avoid it. Instead, please allow yourself to accept and experience the emotional reaction as it is, without trying to affect it. In other words, try to simply observe your emotions as they unfold." The instructions were 110 words in length.

Prior to viewing the traffic accident film, participants practiced using these instructions while viewing a short training film. The training film was an excerpt from *A Tale of Two Cities* (FullWarMovies, 2013), a mildly distressing documentary about the aftermath of the Nagasaki and Hiroshima bombings. In order to assess understanding of the emotion regulation instructions, participants then completed the appropriate 2-item manipulation check questionnaire. If the participant scored less than four on the questionnaire, the research assistant reviewed the instructions again. These participants then completed a second practice of the regulation strategy with the short training film and another manipulation check questionnaire.

Participants who scored below a four again were thanked for their participation and did not continue with the rest of the study. All participants who scored a four or above on the manipulation check questionnaire continued with the study. These participants were instructed to continue using the emotion regulation strategy as they viewed the short traffic safety film. All participants who passed the manipulation check viewed the five-minute traffic accident safety video depicting a motor vehicle accident with fatalities.

Following the film, participants were asked to complete the PANAS based upon how they felt while watching the film. Additionally, participants completed the manipulation check questionnaire assessing their use of the emotion regulation strategy and a 4-item measure assessing avoidance that was created for the present study. The final task of the session was the second administration of the dot probe task (T2) to assess attentional shifting ability following the analogue trauma (i.e., the traffic accident safety video).

Participants were given a list of website links to the intrusions daily diaries to complete with explicit instructions on how to complete the diaries. Participants who did not opt out of email or text reminders were sent automated emails or texts or received phone calls daily as reminders to complete their intrusion diary. Finally, participants were partially debriefed on the true purpose of the experiment. During the debriefing process, participants were given local counseling resources in case the study provoked any persistent distressing thoughts or feelings. In addition, the experimenter asked for participants' cooperation in not discussing this study with other students.

At the second session approximately one week following the first session, participants were asked to complete the dot-probe task a third time (T3) and a self-report measure of intrusions (i.e., the IES regarding past week intrusions). Following completion of the second

session, participants received a full debriefing of the true purpose of the experiment. The list of local counseling resources from the first session was reviewed and made available at the second session.

CHAPTER 3

RESULTS

Manipulation Checks

Manipulation checks were conducted up to three times during the experiment. Six participants (2.7%) were excluded due to failed manipulation checks. Three failed both the first and second manipulation check conducted following the short training film. The three other participants failed the final manipulation check after viewing the trauma video stimulus. This indicates that these participants were able to implement the emotion regulation strategy during the training film but not during the trauma video stimulus. Of note, all six participants were assigned to the cognitive reappraisal condition. Participants included in the final sample endorsed statements on the final manipulation check (following the trauma video stimulus) that suggest a good understanding of the instructions and successful implementation of either cognitive reappraisal (M = 8.34, SD = 1.78) or acceptance (M = 9.16, SD = 1.41) on a scale of zero to ten.

Preparation of Intrusion Diaries

Participants with a low compliance rate (below 50%, equivalent to less than 4 days completed) were not included in the analyses as proposed. Thirty-five percent of participants did not complete at least four days of the intrusion diaries and were excluded. A large amount of data

was missing from each day ranging from 6% on day one to 21% on day seven (median amount was 11%). Given that multilevel modeling for repeated measures was implemented, multiple imputation was not conducted. This technique can flexibly handle missing data by using maximum likelihood estimation (Hoffman & Rovine, 2007). A total intrusions score was calculated by summing the amount of intrusions reported on each day. An average of one intrusion was reported (*SD* = 1.1) in the week following the film.

Preparation of Dot-Probe Task Data

The dot-probe task was completed three times and the data from the first time point was used for the majority of hypothesis testing. At T1, 98.6% of all dot-probe trials had correct responses, with an average of 1.64 incorrect responses per participant (*SD* = 2.20). In order to prepare the disengagement trials to calculate attention shifting ability, the procedures used by Salemink et al. (2007) were applied. Thus, incorrect trials, trials with response times less than 200ms, and trials with response times greater than three standard deviations above the mean response time were discarded in order to reduce the effect of anticipatory responding and outliers (Salemink et al., 2007). Of the T1 responses to disengagement trials, 1.8% were either incorrect or fell outside of the timing guidelines. T1 data from three participants was missing due to machine failure and/or human error in recording data.

At T2, 97.8% of all dot-probe trials had correct responses, with an average of 2.65 incorrect responses per participant (*SD* = 3.74). At T2, 1.5% of responses to disengagement trials were either incorrect or fell outside of the timing guidelines. T2 data from one participant was missing due to machine failure and/or human error in recording data. At T3, 98.4% of all dot-

probe trials had correct responses, with an average of 2.49 incorrect responses per participant (*SD* = 2.79). Less than two percent (1.7%) of T3 responses to disengagement trials were either incorrect or fell outside of the timing guidelines. Of the 114 participants who completed session 2, T3 data from one participant was missing due to machine failure and/or human error in recording data.

Two attentional shifting ability scores were calculated based on valence of stimuli (i.e., negative or trauma-related). Table 1 includes the statistics for detection latencies based on valence of stimuli paired with the neutral probe. Attentional shifting ability for negatively valenced stimuli was calculated by subtracting mean latencies on trials where the probe occurred in the position of a neutral image during negative-neutral pairings from mean latencies on trials where the probe occurred in the position of a neutral image in neutral-neutral pairings. Attentional shifting ability for trauma-related stimuli was calculated by subtracting mean latencies on trials where the probe occurred in the position of a neutral image during trauma-related - neutral pairings from mean latencies on trials where the probe occurred in the position of a neutral image in neutral-neutral pairings. The scores from the first time point were then used to split participants into high or low attention shifting ability based upon a median split. A positive score indicated slower responses to neutral words in the presence of the negatively valenced or trauma-related stimuli in comparison to neutral words in the presence of other neutral words. The median score for attention shifting ability with negatively valenced stimuli was 1.08. The median score for attention shifting ability with trauma-related stimuli was -4.14.

Table 1

Detection latencies based on valence of stimuli (in ms)

Valence of stimuli	Time 1 (n = 150)	Time 2 (n = 152)	Time 3 (n = 114)
	M (SD)	*M* (SD)	*M* (SD)
Neutral	413.63 (58.70)	382.31 (46.04)	372.85 (51.21)
Negative	414.63 (63.50)	382.88 (46.74)	373.54 (39.05)
Trauma	409.97 (58.41)	378.73 (46.26)	367.55 (52.20)

Data Screening

Statistical analyses were conducted with SPSS Version 24.0. Prior to hypothesis testing, assumptions of specific tests were examined to justify their use. Initially, the self-report data was assessed to determine the amount and distribution of missing data. Four (2.6%) data points were missing from the PCL as a result of participants declining to answer questions on this measure. Given that the data appeared to be missing at random using Little's Missing Completely at Random (MCAR) test ($p > .05$), the missing values were replaced by the mean.

The primary variables of interest were inspected to determine if the data followed a normal distribution. According to the Kolmogorov-Smirnov Test, all of the primary variables of interest except for the measure of cognitive reappraisal (ERQ) significantly deviated from a normal distribution. Logarithmic transformations were completed, which only improved distribution for the PANAS scores. A square root transformation was applied to the remaining

variables, which improved distribution for the PCL. Thus, the log-transformed PANAS scores and the square root transformed PCL score were used in subsequent analyses, but the original scores on all other primary variables of interest were retained. Levene's Test for Homogeneity of Variances was also conducted. The Levene statistic was not significant for any variables of interest, indicating homogeneity of variance. Outliers were identified by an analysis of the standardized scores and histograms of the variables. There was a maximum of nine outliers (TLEQ) and four extreme outliers were identified (two from the IES, one from TLEQ, and one from the change score created from the two PANAS scores). These extreme scores were replaced with the next highest value in order to fit the distribution (Field, 2013, 2016).

Pre-experiment Group Differences

In order to assess whether the random assignment procedure worked as intended, the groups were compared on demographic characteristics and pre-film mood. Participants randomly assigned to the cognitive reappraisal condition did not differ from participants randomly assigned to the acceptance condition with regard to age ($t(150) = -.078$, $p = .938$), sex (χ^2 (1, $N = 151$) = 1.503, $p = .220$), ethnicity (χ^2 (5, $N = 151$) = 4.651, $p = .460$), relationship status (χ^2(3, $N = 151$) = 2.679, $p = .444$), habitual use of cognitive reappraisal ($t(151) = .167$, $p = .868$), habitual use of acceptance ($t(151) = .191$, $p = .849$), trauma history ($t(151) = -.646$, $p = .518$), PTSD symptoms ($t(151) = -1.252$, $p = .213$), or pre-film negative affect ($t(151) = .129$, $p = .897$). Participants significantly differed on whether they had previously attended therapy for mental health issues (χ^2 (1, $N = 153$) = 6.389, $p = .011$). Participants assigned to the cognitive reappraisal group were much less likely to have had previous experience with counseling or therapy than participants

assigned to the acceptance condition. As group differences were observed for previous experience in therapy, this variable was considered as a covariate in subsequent analyses.

Data Analysis

Means, standard deviations, and bivariate correlations were conducted for primary variables of interest. Overall descriptive statistics can be found in Table 2. Descriptive statistics based on condition can be found in Table 3. Descriptive statistics based on attention shifting ability can be found in Table 4 and Table 5. Of note, though trauma history was significantly positively associated with PTSD symptoms, it was significantly negatively associated with less avoidance after the film. Consistent with previous research, PTSD symptoms were significantly positively associated with negative affect and intrusions. Habitual use of cognitive reappraisal and habitual use of acceptance demonstrated a significant positive relationship. Notably, these measures demonstrated different relationships with negative affect. Habitual reappraisal was significantly positively associated with negative affect, while habitual acceptance was significantly negative associated with negative affect. However, these associations were only significant within the full sample and not when participants were split into groups based upon attention shifting ability with negatively valenced stimuli. Two associations remained positive when participants were split into groups based upon attention shifting ability with trauma-related stimuli. The positive association between habitual reappraisal and post-film negative affect remained significant for individuals with low attention shifting ability. The negative association between habitual acceptance and post-film negative affect also remained significant for individuals with high attention shifting ability.

Table 2

Descriptive Statistics of Primary Variables of Interest (N = 153)

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Trauma history	--											
2. Habitual reappraisal	.03	--										
3. Habitual acceptance	-.01	.23*	--									
4. PTSD symptoms	.26*	-.09	-.29*	--								
5. Avoidance during film	-.11	-.002	-.08	.10	--							
6. Avoidance after film	-.34*	-.12	.07	-.13	.30*	--						
7. Pre-film PANAS	-.06	-.06	-.25*	.07	.11	.01	--					
8. Post-film PANAS	-.05	.18*	-.20*	.17*	.38	.03	.35*	--				
9. Attention negative T1	-.09	-.04	.03	-.01	.08	-.05	-.05	.04	--			
10. Attention trauma T1	-.01	-.01	.01	.01	.05	-.08	-.06	.01	.26*	--		
11. Intrusions from diary	-.10	.15	-.14	.09	.14	-.06	.04	.19	-.10	.02	--	
12. Intrusions from IES	.05	.04	-.27*	.38*	.31*	-.06	.02	.33*	.03	-.03	.51*	--
M	6.72	5.24	2.84	12.19	1.25	2.84	1.25	1.85	.99	-3.67	1.05	.44
SD	6.67	1	.92	10.16	1.78	2.88	.30	.70	25.15	22.69	1.1	.30
Minimum	0	2.33	0	0	0	0	1	1	-94.68	-59.87	0	0
Maximum	30	7	4	36	9	10	2.33	4.10	122.15	86.69	4	2.63
n	153	153	153	153	153	153	153	153	150	150	100	113

Note. The t-test using PTSD was conducted using the square root transformed score. ANOVAs and regressions for change in negative affect using PANAS scores were conducted using logarithmic transformed scores. The avoidance composite was created using z-scores for both avoidance measures. Means and standard deviations reported above are prior to the standardization of scores. *$p < .05$.

Table 3

Descriptive Statistics of Primary Variables of Interest by Condition (N = 153)

Variables	1	2	3	4	5	6	7	8
1. Avoidance during film	--	.27	.15	.32*	.18	-.09	.06	.20
2. Avoidance after film	.32*	--	-.18	-.05	.04	-.07	-.08	-.10
3. Pre-film PANAS	.09	.18	--	.43*	-.07	-.01	.24	.04
4. Post-film PANAS	.43*	.09	.29*	--	.16	.04	.15	.28*
5. Attention negative T1	-.01	-.14	-.03	-.10	--	.22	.16	.06
6. Attention trauma T1	.14	-.10	-.11	-.01	.32*	--	.06	-.05
7. Intrusions from diary	.20	-.03	-.11	.22	.04	-.09	--	.50*
8. Intrusions from IES	.41*	-.02	-.01	.39*	-.01	-.02	.55*	--
Cognitive Reappraisal								
M	1.16	2.53	1.26	1.79	1.69	-4.75	.43	1.18
SD	1.63	2.66	.30	.68	27.99	20.01	.50	1.03
Acceptance								
M	1.34	3.16	1.25	1.90	.29	-2.59	.44	.95
SD	1.93	3.07	.30	.73	22.12	25.17	.45	1.15

Note. Cognitive Reappraisal (N = 76) statistics can be found above the diagonal and Acceptance (N = 77) statistics can be found below. ANOVAs and regressions for change in negative affect using PANAS scores were conducted using logarithmic transformed scores. The avoidance composite was created using z-scores for both avoidance measures. Means and standard deviations reported above are prior to the standardization of scores. *$p < .05$.

Table 4

Descriptive Statistics of Primary Variables of Interest by Attention Shifting Ability with Negatively Valenced Stimuli (N = 153)

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Trauma history	--	.21	.02	.33*	.05	-.32*	-.20	.06	.17	.13	-.07	.08
2. Habitual reappraisal	-.11	--	.24*	-.10	-.01	-.18	-.07	.17	.15	.08	.12	-.01
3. Habitual acceptance	-.01	.23*	--	-.34*	-.02	.06	-.22	-.22	.08	-.01	-.07	-.34*
4. PTSD symptoms	.21	-.11	-.23*	--	.12	-.13	-.02	.11	-.01	.09	.03	.57*
5. Avoidance during film	-.25*	.01	-.14	.09	--	.34*	.19	.41*	.07	-.08	-.02	.28*
6. Avoidance after film	-.37*	-.07	.08	-.14	.26*	--	.11	.13	-.02	-.09	.04	-.06
7. Pre-film PANAS	.01	-.08	-.26*	.13	.05	-.08	--	.33*	-.05	-.01	-.23	-.08
8. Post-film PANAS	-.12	.18	-.19	.23*	.36*	-.06	.38*	--	.10	-.06	.07	.28*
9. Attention negative T1	-.15	-.03	-.10	.09	.07	-.09	.11	.03	--	-.04	.04	-.06
10. Attention trauma T1	-.04	-.02	-.01	-.03	.16	-.08	-.07	.08	.37*	--	-.05	-.16
11. Intrusions from diary	-.11	.22	-.22	.20	.33*	-.17	.31*	.33*	.03	-.02	--	.53*
12. Intrusions T2	.02	.14	-.19	.16	.36*	-.04	.18	.43*	.11	.14	.52*	--
Low												
M	5.76	5.12	2.89	11.40	1.33	2.83	1.22	1.83	18.23	1.41	1.20	.47
SD	5.50	.95	.87	10.11	1.95	2.97	.29	.70	20.79	19.85	1.06	.55
High												
M	7.64	5.35	2.79	12.96	1.17	2.86	1.29	1.85	-16.24	-8.75	.90	.40
SD	7.54	1.05	.96	10.22	1.61	2.81	.32	.72	15.48	24.30	1.12	.37

Note. Low ability (N = 76) statistics can be found above the diagonal and High ability (N = 77) statistics can be found below. The t-test using PTSD was conducted using the square root transformed score. ANOVAs and regressions for change in negative affect using PANAS scores were conducted using logarithmic transformed scores. The avoidance composite was created using z-scores for both avoidance measures. Means and standard deviations reported above are prior to the standardization of scores. *$p < .05$.

Table 5

Descriptive Statistics of Primary Variables of Interest by Attention Shifting Ability with Trauma Related Stimuli (N = 153)

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Trauma history	--	.05	-.09	.25*	.14	-.35*	-.03	.11	.02	.07	-.10	.16
2. Habitual reappraisal	.02	--	.31*	-.04	.14	-.05	.01	.30*	-.06	.02	.08	-.04
3. Habitual acceptance	.08	.14	--	-.26*	.06	.15	-.21	-.08	.01	.02	-.22	-.25
4. PTSD symptoms	.27*	-.14	-.32*	--	.22	-.06	.01	.15	-.11	.02	.04	.43*
5. Avoidance during film	-.27*	-.10	-.17	.03	--	.17	.08	.37*	-.06	.28*	-.18	.35*
6. Avoidance after film	-.33*	-.19	-.1	-.20	.38*	--	.08	.02	-.05	.08	-.18	.05
7. Pre-film PANAS	-.08	-.13	-.28*	.13	.14	-.07	--	.33*	-.14	-.06	.13	.15
8. Post-film PANAS	-.18	.07	-.32*	.19	.41*	.05	.38*	--	-.09	.09	.08	.35*
9. Attention negative T1	-.20	-.03	.04	.04	.21	.03	.01	.12	--	-.01	-.06	-.18
10. Attention trauma T1	-.24*	-.03	-.07	-.04	.19	.02	-.11	-.09	.19	--	.06	.06
11. Intrusions from diary	-.07	.24	-.06	.15	.30*	.03	-.05	.27	.26	.24	--	.37*
12. Intrusions T2	.01	.09	-.31*	.36*	.27*	-.15	-.06	.33*	.16	.12	.63*	--
Low												
M	6.95	5.23	2.87	12.19	1.01	2.41	1.23	1.85	7.95	13.07	.98	.39
SD	6.59	.99	.96	9.98	1.46	2.83	.32	.67	20.02	17.53	1.04	.33
High												
M	6.5	5.24	2.81	12.20	1.47	3.26	1.26	1.83	-5.97	-20.41	1.13	.49
SD	6.78	1.03	.88	10.41	2.03	2.89	.29	.74	27.83	12.70	1.16	.59

Note. Low ability (N = 75) statistics can be found above the diagonal and High ability (N = 78) statistics can be found below. The t-test using PTSD was conducted using the square root transformed score. ANOVAs and regressions for change in negative affect using PANAS scores were conducted using logarithmic transformed scores. The avoidance composite was created using z-scores for both avoidance measures. Means and standard deviations reported above are prior to the standardization of scores. *$p < .05$.

To test the first hypothesis, that there will be a significant difference in negative affect change between emotion regulation conditions (i.e., cognitive reappraisal and acceptance, H1a) and between individuals with low versus high attention shifting ability (with negatively valenced stimuli and trauma-related stimuli; H1b), three separate one-way ANCOVAs were conducted using the change score created from the two measures of negative affect that were log transformed (i.e. the PANAS given before the film and the PANAS given after the film). Given that previous therapy experience differed between conditions, it was included in the analyses as a control variable. It was expected that individuals instructed to use cognitive reappraisal would report smaller increases in levels of negative affect from baseline than individuals in the acceptance condition. Inconsistent with H1a, there was no significant group difference between individuals in the cognitive reappraisal (M = -.53, SD = .61) versus individuals in the acceptance condition (M = -.49, SD = 1.73) on negative affect change (F(1, 150) = .841, p = .361).

Further, inconsistent with H1b, individuals with low attention shifting abilities (i.e., greater difficulty disengaging from stimuli prior to watching a film clip of a motor vehicle accident) did not report greater increases in levels of negative affect from baseline immediately following the short film clip than individuals with high attention shifting abilities. Changes in negative affect did not differ between individuals with low attention shifting ability (M = -.62, SD = .66) and individuals with high attention shifting ability (M = -.41, SD = 1.70; F(1, 150) = .421, p = .517) on negatively valenced stimuli. Similarly, there were no group differences between individuals with low (M = -.61, SD = .64) versus high (M = -.42, SD = 1.71 attention shifting ability on trauma-related stimuli (F(1, 150) = .303, p = .583).

These results were replicated using a regression based approach and continuous scores for variables of attention shifting ability. The median split of continuous scores for variables

results in a large loss of power (Maxwell & Delaney, 1993). Thus, post-hoc hierarchical regression analyses were conducted for hypotheses surrounding differences based on attention shifting ability (H1b, H2b, and H3b). Prior to the hierarchical regression analyses, the attention shifting ability and outcome variables were examined for collinearity. Correlations, variance inflation factors (VIF), and tolerance statistics were used to assess for collinearity (Field, 2009). Multicollinearity was not present, as evidenced by Pearson correlations (Table 2) lower than .80, tolerance statistics above 0.2, and because the average variance inflation factor was 1. An examination of the Mahalanobis distance scores indicated no multivariate outliers.

Two separate hierarchical regressions were conducted to test H1b. Previous therapy experience was entered into the first step in both analyses in order to control for this variable. The regression analysis revealed that at step one, previous therapy experience did not significantly predict change in negative affect, $F(1, 148) = .185$, $p = .668$, $R^2 = .001$. Adding attention shifting ability for negatively valenced stimuli in step 2 did not cause R^2 to increase significantly, $F(2, 147) = .451$, $p = .638$, $R^2 = .006$ (Table 6). Similarly, adding attention shifting ability for trauma-related stimuli in step 2 of the second regression did not cause R^2 to increase significantly, $F(2, 147) = .410$, $p = .665$, $R^2 = .006$ (Table 7).

Table 6

Hierarchical Regression Analysis Testing the Effects of Attentional Shifting with Negatively Valenced Stimuli

Predictors	Outcome: change in negative affect (n= 150)			Outcome: intrusions (n=110)			Outcome: avoidance composite (n=150)		
	B	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Step 1									
Constant	-.150*	.014		.426*	.047		-.018*	.077	
Prev Therapy	-.012	.029	-.035	.033	.096	.033	.084	.153	.045
Step 2									
Constant	-.149*	.014		.425*	.048		-.018*	.077	
Prev Therapy	-.011	.029	-.032	.033	.097	.033	.082	.153	.044
AS (Negative)	.000	.000	-.070	.000	.002	.021	.001	.003	.020

Note. AS = attention shifting ability

Table 7

Hierarchical Regression Analysis Testing the Effects of Attentional Shifting with Trauma-Related Stimuli

Predictors	Outcome: change in negative affect (n= 150)			Outcome: intrusions (n=110)			Outcome: avoidance composite (n=150)		
	B	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Step 1									
Constant	-.150*	.014		.426*	.047		-.018*	.077	
Prev Therapy	-.012	.029	-.035	.033	.096	.033	.084	.153	.045
Step 2									
Constant	-.152*	.015		.424*	.048		-.023*	.079	
Prev Therapy	-.009	.029	-.027	.033	.097	.033	.090	.154	.048
AS (Trauma)	.000	.001	-.066	.000	.002	-.024	-.001	.003	-.026

Note. AS = attention shifting ability

The second hypothesis states there will be a significant difference in post-film intrusions between emotion regulation conditions (i.e., cognitive reappraisal and acceptance, H2a) and between individuals with low versus high attention shifting ability (with negatively valenced stimuli and trauma-related stimuli; H2b). As noted, intrusions were measured in two ways: using daily diaries and the IES-R. First, the total score created from the intrusion diaries was used. Multilevel modeling (MLM; Table 8) was used with intrusion score (level-1) nested within participants (level 2). Maximum likelihood estimation was used given the adequate sample size (Hayes, 2006). Since the predictors (previous therapy experience [covariate], condition, and attention shifting ability) are categorical, they were all considered as fixed effects. An empty model was tested first, which included no predictors in order to provide a baseline comparison (Hayes, 2006). Then, previous therapy experience and condition were entered one at a time to test their contribution to the model (Table 8). Neither previous therapy experience ($F(1, 616) = .128$, $p = .720$) nor condition ($F(1,616) = 1.354$, $p = .245$) was significant. Next, condition was removed and attention shifting ability with negatively valenced stimuli was entered as a predictor. Neither previous therapy ($F(1, 616) = .036$, $p = .849$) nor attention shifting ability with negatively valenced stimuli ($F(1,616) = 1.57$, $p = .211$) was significant. In the final model, previous therapy experience and attention shifting ability with trauma-related stimuli were entered as predictors. Neither previous therapy ($F(1, 616) = .079$, $p = .778$) nor attention shifting ability with trauma-related stimuli ($F(1,616) = .495$, $p = .482$) significantly predicted intrusions as measured by the daily diaries.

Table 8

Multilevel modeling estimated parameters (with standard error of estimate in parentheses) for condition and attention separately predicting intrusions

	Model 1 (empty)	Model 2 (+ prev therapy	Model 3 (+condition)	Model 4 (+AS negative)	Model 5 (+AS trauma)
Fixed effects					
Intercept	.170 (.016)*	.169 (.019)*	.226 (.053)*	.188 (.025)*	.156 (.026)*
Prev therapy		.007 (.036)	.013 (.037)	.007 (.036)	.010 (.037)
Condition			-.038 (.033)		
AS (negative)				-.041 (.033)	
AS (trauma)					.023 (.032)
Random Effects					
Residual	.164 (.009)*	.164 (.009)*	.164 (.009)*	.164 (.009)*	.164 (.009)*
Model Summary					
Deviance (-2LL)	634.95	634.91	633.56	633.35	634.42

Note. Parameter estimate standard errors listed in parentheses. * p<.05

A secondary examination of intrusions was completed using the IES-R. The IES-R was completed by individuals who attended the second session (n = 114). Consistent with previous analyses using the diaries, there were no significant group differences between individuals in the cognitive reappraisal (M = .42, SD = .46) versus individuals in the acceptance condition (M = .43, SD = .41) on self-reported intrusions in the week following the trauma video (F(1, 110) = .000, p = .989). Additionally, individuals with low attention shifting abilities did not report higher levels of intrusive thoughts than individuals with high attention shifting abilities. Self-reported intrusions on the IES-R did not differ (F(1, 110) = .296, p = .587) between individuals with low attention shifting ability on negatively valenced stimuli (M = .45, SD = .49) and individuals with high attention shifting ability (M = .40, SD = .37). Similarly, there were no group differences between individuals with low (M = .39, SD = .33) versus high (M = .47, SD = .52) attention shifting ability on trauma-related stimuli (F(1, 110) = .965, p = .328).

To test the third hypothesis, that there will be a significant difference in avoidance between emotion regulation conditions (i.e., cognitive reappraisal and acceptance, H3a) and between individuals with low versus high attention shifting ability (with negatively valenced stimuli and trauma-related stimuli; H3b), three separate one-way ANCOVAs were conducted using previous therapy experience as a covariate and the avoidant tendencies composite score as the dependent variable. It was expected that individuals instructed to use acceptance would report lower levels of avoidance than individuals in the cognitive reappraisal condition. Inconsistent with H3a, there were no significant group differences between individuals in the cognitive reappraisal (M = -.08, SD = .73) versus individuals in the acceptance condition (M = .08, SD = .87) on the composite avoidance score (F(1, 150) = 1.241, p = .267). Avoidance scores ranged from zero to ten, with higher scores indicating more avoidance. Participants in

both the cognitive reappraisal condition (*M* = 1.16, *SD* = 1.63) and the acceptance condition (*M* = 1.34, *SD* = 1.93) experienced minimal avoidance during the film. Similarly, participants in both the cognitive reappraisal condition (*M* = 2.53, *SD* = 2.66) and the acceptance condition (*M* = 3.16, *SD* = 3.07) reported minimal avoidance after the film.

Inconsistent with H3b, individuals with low attention shifting abilities did not report higher levels of avoidance than individuals with high attention shifting abilities. Levels of avoidance did not differ ($F(1, 150) = .083$, $p = .774$) between individuals with low attention shifting ability (*M* = .02, *SD* = .87) and individuals with high attention shifting ability (*M* = -.02, *SD* = .75) on negatively valenced stimuli. Participants with low attention shifting ability (*M* = 1.33, *SD* = 1.95) and high attention shifting ability (*M* = 1.17, *SD* = 1.61) on negatively valenced stimuli experienced minimal avoidance during the film. Similarly, participants with low attention shifting ability (*M* = 2.83, *SD* = 2.97) and high attention shifting ability (*M* = 2.86, *SD* = 2.81) on negatively valenced stimuli reported minimal avoidance after the film. In contrast to expectations, individuals with low attention shifting ability on trauma-related stimuli (*M* = -.14, *SD* = .69) exhibited lower levels of avoidance ($F(1, 150) = 5.014$, $p = .027$) than individuals with high attention shifting ability on trauma-related stimuli (*M* = .14, *SD* = .89). Overall, participants with low attention shifting ability (*M* = 1.01, *SD* = 1.46) and high attention shifting ability (*M* = 1.47, *SD* = 2.03) on trauma-related stimuli experienced minimal avoidance during the film. Similarly, participants with low attention shifting ability (*M* = 2.41, *SD* = 2.83) and high attention shifting ability (*M* = 3.26, *SD* = 2.89) on trauma-related stimuli reported minimal avoidance after the film.

This hypothesis was also tested using two separate hierarchical regressions and the continuous scores for variables of attention shifting ability (Table 6 and Table 7). Previous

therapy experience was entered into the first step in both analyses. The regression analysis revealed that at step one, previous therapy experience did not significantly predict avoidance, $F(1, 148) = .302$, $p = .584$, $R^2 = .002$. Adding attention shifting ability for negatively valenced stimuli in step 2 did not cause R^2 to significantly increase, $F(2, 147) = .180$, $p = .836$, $R^2 = .002$. Inconsistent with the ANCOVA analysis, adding attention shifting ability for trauma-related stimuli in step 2 of the second regression did not cause R^2 to significantly increase, $F(2, 147) = .199$, $p = .819$, $R^2 = .003$.

Research Questions

To test the first research question regarding whether there will be an interaction between emotion regulation condition and attentional shifting ability in predicting distress, separate analyses were conducted for each measure of distress (i.e. change in negative affect, intrusions, avoidance). First, a factorial ANOVA was used to test the interaction in predicting change in negative affect using previous therapy experience as a covariate. Consistent with previous analyses, the main effects were not significant. The interaction between the effects of emotion regulation condition and attention shifting ability with negatively valenced stimuli on change in negative affect was not significant ($F(1, 148) = 2.504$, $p = .116$).

This question was also examined using a regression-based approach with the continuous attention shifting ability score. The interaction analysis was performed using Model 1 of the PROCESS macro version 2.15 (Hayes, 2013; Tables 9 and 10). In contrast to the factorial ANOVA, when attention shifting ability for negatively valenced terms and condition were examined in predicting change in negative affect, the relationship was significant for cognitive

reappraisal condition (95% CI: -.003 - 0; effect = -.001, se effect = .001, p = .04), but not for the acceptance condition (95% CI: -.001 - .003; effect = .001, se effect = .001, p = .26). Results (Figure 7) showed a significant interaction (95% CI: .0002 - .0042; effect = .0022, se effect = .001, p = .03). At higher levels of attention shifting ability (when the score is negative), individuals in the cognitive reappraisal condition experienced more change in negative affect than individuals in the acceptance condition. At lower levels of attention shifting ability (when the score is positive), individuals in the cognitive reappraisal condition experienced less change in negative affect than individuals in the acceptance condition.

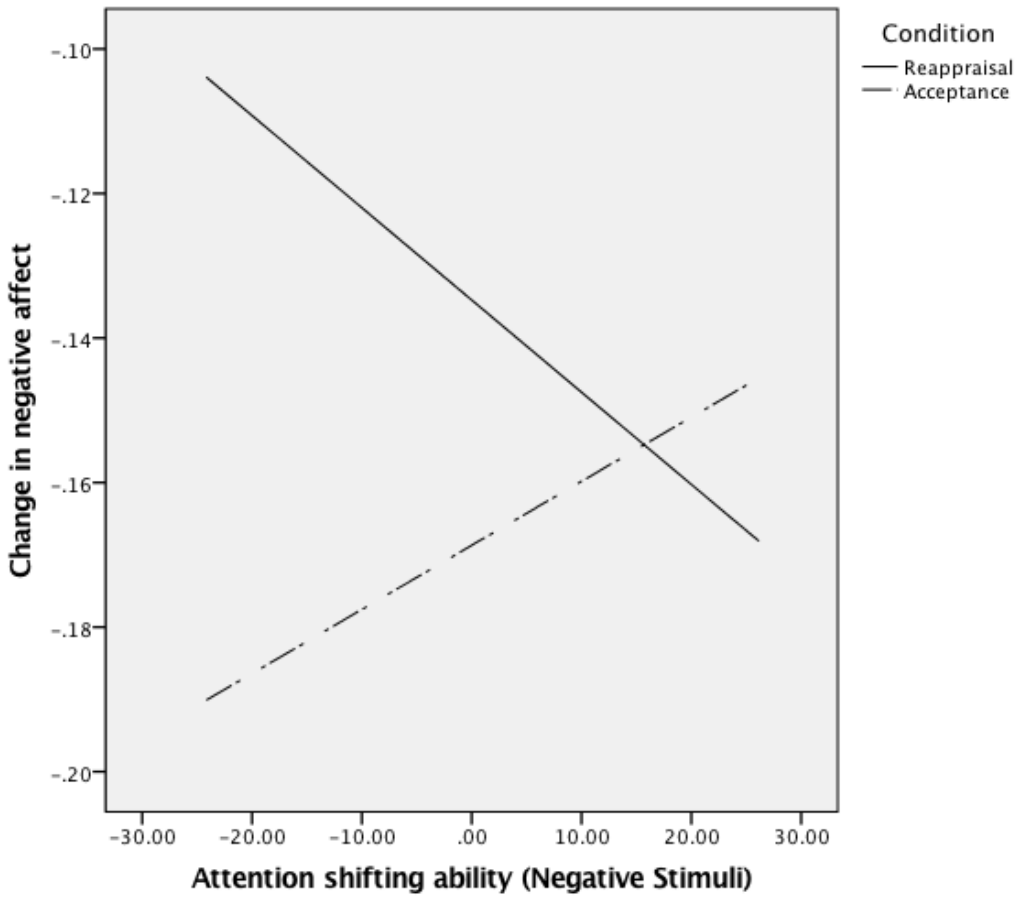

Figure 7. The interaction between attention shifting ability with negatively valenced stimuli and condition on change in negative affect. This figure demonstrates a significant interaction. At higher levels of attention shifting ability (when the score is negative), individuals in the cognitive reappraisal condition experienced more change in negative affect than individuals in the acceptance condition. At lower levels of attention shifting ability (when the score is positive), individuals in the cognitive reappraisal condition experienced less change in negative affect than individuals in the acceptance condition.

Table 9

Moderated Regression Analysis Testing the Effects of Attentional Shifting with Negatively Valenced Stimuli

Predictors	Outcome: change in negative affect (n=150)				Outcome: intrusions (n = 111)				Outcome: avoidance composite (n = 150)			
	Coeff.	SE	LLCI	ULCI	Coeff.	SE	LLCI	ULCI	Coeff	SE	LLCI	ULCI
Constant	-.099*	.039	-.176	-.023	.404*	.147	.113	.696	-.277	.210	-.692	.138
Prev therapy	-.005	.029	-.063	.052	.047	.111	-.174	.266	.047	.157	-.263	.356
Condition	-.034	.025	-.084	.016	.017	.096	-.172	.207	.178	.136	-.091	.447
AS (Negative)	-.003*	.002	-.006	-.001	.002	.005	-.008	.012	.011	.008	-.005	.027
AS*Condition	.002*	.001	.001	.004	-.001	.004	-.008	.006	-.007	.005	-.018	.004

Note. AS = attention shifting ability

Table 10

Moderated Regression Analysis Testing the Effects of Attentional Shifting with Trauma-Related Stimuli

Predictors	Outcome: change in negative affect (n=150)				Outcome: intrusions (n = 110)				Outcome: avoidance composite (n = 150)			
	Coeff.	SE	LLCI	ULCI	Coeff.	SE	LLCI	ULCI	Coeff	SE	LLCI	ULCI
Constant	-.107*	.040	-.187	-.027	.406*	.148	.113	.699	-.301	.216	-.727	.126
Prev therapy	-.002	.030	-.060	.057	.045	.111	-.175	.266	.043	.158	-.269	.356
Condition	-.031	.026	-.083	.020	.016	.096	-.175	.207	.190	.139	-.084	.465
AS (Trauma)	-.001	.002	-.004	.003	-.002	.007	-.017	.013	-.008	.010	-.028	.012
AS*Condition	.000	.001	-.002	.002	.001	.005	-.008	.010	.004	.006	-.008	.016

Note. AS = attention shifting ability

Next, a factorial ANOVA was used to examine the interaction between the effects of emotion regulation condition and attention shifting ability with trauma-related stimuli on change in negative affect. Consistent with previous analyses, the main effects were not significant. The interaction was also not significant ($F(1, 148) = 1.127$, $p = .290$) for condition and attention shifting ability with trauma-related stimuli on negative affect. These results were replicated using a regression-based approach with the continuous attention shifting ability score. When attention shifting ability for trauma-related stimuli and condition were examined in predicting change in negative affect, the relationship was not significant for the cognitive reappraisal condition (95% CI: -.002 - .001; effect = -.0004, se effect = .001, $p = .62$), or the acceptance condition (95% CI: =. -.002 - .001 effect = -.0004, se effect = .001, $p = .56$). Results showed a non-significant interaction (95% CI: -.002 - .002; effect = 0, se effect = .001, $p = .98$).

Multilevel modeling (Table 11) was used to test the interactive effect of emotion regulation condition and attention shifting ability in predicting intrusions over one week (level-1) within participants (level-2). Again, the predictors were all considered as fixed effects. An empty model was again tested first as a baseline comparison. In the next models, previous therapy experience, condition, attention shifting ability with negatively valenced stimuli, and the interaction were entered as predictors. The interaction was not significant ($F(1,616) = .077$, $p = .782$). The final model tested the interaction between condition and attention shifting ability with trauma-related stimuli as predictors, as well as previous therapy experience. The interaction was also not significant ($F(1,616) = 2.82$, $p = .093$).

Table 11

Multilevel modeling estimated parameters (with standard error of estimate in parentheses) for condition and attention interacting to predict intrusions

	Model 1 (empty)	Model 2 (+ prev therapy)	Model 3 (+condition)	Model 4 (+AS negative)	Model 5 (+interaction)	Model 6 (+AS trauma)	Model 7 (+ interaction)
Fixed effects							
Intercept	170 (.016)*	.169 (.019)*	.226 (.053)*	.242 (.055)*	.229 (.073)*	.214 (.056)*	.296 (.074)*
Prev therapy		.007 (.036)	.013 (.037)	.013 (.037)	.013 (.037)	.017 (.037)	.022 (.037)
Condition			-.038 (.033)	-.037 (.033)	-.028 (.045)	-.039 (.033)	-.093 (.046)
AS (negative)				-.039 (.033)	-.011 (.107)		
AS (trauma)						.024 (.033)	-.146 (.106)
Cond*AS (negative)					-.018 (.066)		
Cond*AS (trauma)							.110 (.066)
Random Effects							
Residual	164 (.009)*	.164 (.009)*	.164 (.009)*	.164 (.009)*	.163 (.009)*	.164 (.009)*	.163 (.009)*
Model Summary							
Deviance (-2LL)	634.95	634.91	633.5	632.12	632.05	632.03	630.21

Note. Parameter estimate standard errors listed in parentheses. * p<.05

Two factorial ANOVAs were also used to examine the interaction between the effects of emotion regulation condition and attention shifting ability on intrusions using the IES-R. Consistent with previous analyses, the main effects were not significant for both analyses. The interaction was not significant ($F(1, 108) = 1.97$, $p = .163$) for condition and attention shifting ability with negatively valenced stimuli on intrusions. Similarly, the interactive effect of condition and attention shifting ability with trauma-related stimuli on intrusions was not significant ($F(1, 108) = 1.974$, $p = .163$). These results were also replicated using a regression-based approach with the continuous attention shifting ability scores. When attention shifting ability for negatively valenced stimuli and condition were examined in predicting intrusions on the IES-R, the relationship was not significant for the cognitive reappraisal condition (95% CI: -.003 - .005; effect = .001, se effect = .002, $p = .60$), or the acceptance condition (95% CI: -.006 - .006; effect = .001, se effect = .002 $p = .64$). Results showed a non-significant interaction (95% CI: -.008 - .006; effect = -.001, se effect = .004, $p = .76$). When attention shifting ability for trauma-related stimuli and condition were examined in predicting intrusions from the IES-R, the relationship was also not significant for the cognitive reappraisal condition (95% CI: -.008 - .006; effect = -.001, se effect = .003, $p = .72$), or the acceptance condition (95% CI: -.006 - .005; effect = -.0003, se effect = .003, $p = .90$). Results showed a non-significant interaction (95% CI: -.0079 - .0097; effect = .0009, se effect = .0045, $p = .84$).

Finally, the interaction was examined using avoidance as the outcome. Two factorial ANOVAs were used to examine the interaction between the effects of emotion regulation condition and attention shifting ability using the avoidant tendencies composite score. Consistent with previous analyses, the main effects were not significant for both analyses. The interaction of condition and attention shifting ability with negatively valenced stimuli was not significant on

avoidance ($F(1, 148) = .012$, $p = .912$). Similarly, the interactive effect of condition and attention shifting ability with trauma-related stimuli on avoidance was not significant ($F(1, 148) = .030$, $p = .862$).

Regression models were also used secondarily to examine the interaction in predicting avoidance. The relationship between attention shifting ability with negatively valenced stimuli and condition was not significant for the cognitive reappraisal condition (95% CI: -.0031 - .0102; effect = .0035, se effect = .0034, $p = .30$), or the acceptance condition (95% CI: -.0121 - .0048; effect = -.0036, se effect = .0043, $p = .40$). The interaction was also not significant (95% CI: -.0179 - .0036; effect = -.007, se effect = .005, $p = .19$). When attention shifting ability for trauma related stimuli and condition were examined, the relationship was not significant for the cognitive reappraisal condition (95% CI: -.013 - .006; effect = -.0037, se effect = .0047, $p = .44$), or the acceptance condition (95% CI: -.0068 - .0082; effect = .001, se effect = .0038, $p = .86$). Results showed a non-significant interaction (95% CI: -.0076 - .0163; effect = .0044, se effect = .0061, $p = .47$).

To test the second research question, two separate mixed ANOVAs were completed to determine whether attention shifting ability across three time points varies as a function of assigned emotion regulation strategy. The between-subjects factor for both analyses was emotion regulation condition. The continuous measures of attention shifting ability using negatively valenced stimuli and trauma-relevant stimuli from the three time points were the dependent variables. The effect of emotion regulation condition was not significant on attention shifting ability with negatively valenced stimuli, Wilks' Lambda = .995, F (2, 108) = .627, $p = .536$. The effect of emotion regulation condition was also not significant on attention shifting ability with trauma-related stimuli, Wilks' Lambda = .997, F (2, 108) = .496, $p = .610$.

CHAPTER 4

DISCUSSION

Trauma-focused research has shown that high attentional control serves as a buffer against posttraumatic stress symptoms and other pathology. However, less is known in regard to the influence of attentional processes on the effectiveness of treatment strategies used to reduce symptoms. The present study compared the effectiveness of two prominent strategies (cognitive reappraisal and acceptance) on minimizing increases in negative affect, intrusions, and avoidance following exposure to a stressful film. Additionally, the current study examined the impact of individual differences in the ability to disengage and shift attention on minimizing distress. Further, the relationship between this ability and the effectiveness of common treatment strategies was explored.

Zero order correlations between primary variables of interest revealed several notable associations (Table 2). As expected, trauma history was significantly positively associated with PTSD symptoms. However, greater trauma history was significantly associated with less avoidance after the film. Avoidance after the film was defined as an unwillingness to be contacted for additional paid experimental research in which the participant would be asked to view another film clip that depicts vehicular accidents or elicit similar emotional reactions. The relationship between higher frequency of exposure to traumatic events and less avoidance may indicate that the potency of the film was relatively low in comparison to the traumatic events participants have experienced. Of note, higher PTSD symptomatology was significantly

associated with higher levels of post-film negative affect and intrusions. This supports the use of the provisional PTSD diagnosis as an exclusion criteria and is consistent with expectations that participants with a high degree of posttraumatic stress symptoms would experience heightened distress while participating in the study. Interestingly, greater avoidance during the film was significantly associated with higher intrusion scores at the second session. This is consistent with prominent behavioral models of PTSD suggesting that avoidance of trauma-related information hinders recovery from trauma exposure (Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989). This is particularly notable given that the overall level of intrusions was extremely low.

Further, although habitual use of cognitive reappraisal was significantly related to greater habitual acceptance in the overall sample, the two strategies had different associations with post-film negative affect. While habitual reappraisal was associated with greater post-film negative affect, habitual acceptance was associated with less post-film negative affect. This suggests that individuals who have less difficulty accepting emotions as they naturally occur experience less negative affect immediately following a distressing stimulus than individuals who attempt to change their thoughts or interpretations to alter their emotional reaction. These associations were no longer significant when participants were split into groups based upon attention shifting ability with negatively valenced stimuli. When participants were split into groups based upon attention shifting ability with trauma-related stimuli, one association remained significant for each group. The association between higher reappraisal and higher post-film negative affect remained significant for individuals with low attention shifting ability. The association between higher acceptance and lower post-film negative affect also remained significant for individuals with high attention shifting ability. This suggests that attentional shifting ability plays a role in the impact of the emotion regulation strategy on the negative affect experienced immediately

following exposure to a distressing stimulus. Interestingly, attention shifting ability alone was not significantly related to any primary variables of interest in the overall sample or when separated by condition.

Cognitive Reappraisal and Acceptance

Research has identified emotion regulation strategies as prominent mechanisms of change in traditional cognitive behavioral therapy (e.g. Resick et al., 2008) as well as in Acceptance and Commitment Therapy (e.g. Hayes et al., 2004). The current study sought to compare key strategies used in these two prominent treatments to better understand and facilitate treatment for trauma-related distress. Participants were instructed to use either cognitive reappraisal or acceptance and subsequently given the opportunity to practice the strategies prior to watching a trauma video stimulus. The manipulation checks demonstrated that the majority of participants understood and were able to implement the strategies as instructed. As seen in Table 3, participants in both conditions experienced little change in negative affect from baseline to post-film. Moreover, very few intrusions were reported and participants typically experienced low levels of avoidance. This suggests that the trauma video stimulus lacked potency, which will be discussed as a possible limitation.

In contrast with the hypotheses, results revealed no significant group differences between individuals assigned to use cognitive reappraisal and individuals assigned to use acceptance in negative affect, level of intrusive thoughts, or amount of self-reported avoidance following the trauma video stimulus. These results correspond to two of the main findings of Wolgast et al. (2011), in which these strategies were used to reduce distress following film-clips expected to

induce fear, disgust, and sadness. Similarly, no significant group differences were observed in relation to distress following the fear and sadness film-clips. However, Wolgast and colleagues (2011) observed that participants instructed to use cognitive reappraisal reported less negative affect following the "disgust" film-clip than participants instructed to use acceptance. Fear and sadness may be more typical responses to trauma than disgust, particularly since fear and sadness are included in the diagnosis for PTSD (e.g., persistent state of fear, diminished interest in significant activities; APA, 2014). Thus, responses to the trauma video stimulus included in the current study may be more similar to responses elicited from the fear and sadness film-clips shown in Wolgast et al. (2011). The results from the current study suggest that reappraisal and acceptance may be equally effective as strategies for managing trauma-related distress.

Although the current results are similar to the findings from Wolgast et al. (2011), they differ from several studies (Germain & Kangas, 2015; Hofmann et al., 2009; Szasz et al., 2011) that found reappraisal to be more beneficial than acceptance in regulating emotions. Notably, the current study adapted the regulation instructions from the Wolgast et al. (2011) study. The cognitive reappraisal instructions differed from those used in previous studies, as the intention to reduce distress was not explicitly stated in the instructions used in the current study. Previous studies have typically based the cognitive reappraisal instructions off of Gross' (1998b) original study, which instructed participants to "Watch the film clip carefully, but please try to think about what you are seeing in such a way that you don't feel anything at all" (p. 227). These instructions specify the emotional reaction participants are expected to demonstrate following the clip. For example, the reappraisal instructions that led to a stronger reduction in subjective feelings of anxiety in comparison to acceptance stated, "Please try to take a realistic perspective on this task, by recognizing that there is no reason to feel anxious...it is just an experiment, and

there are no negative consequences to be concerned with" (Hofman et al., 2009, p.4). Although Szasz and colleagues (2011) used instructions based off of rational-emotive and cognitive behavior therapy, the reappraisal instructions similarly stated explicitly that the expected emotional reaction should not be negative. These instructions, which led to lower levels of anger than acceptance instructions, stated, "It would be preferable that others are nice and/or fair to you, but if they are not, you can tolerate it, and go on enjoying life, even if it's more difficult in the beginning" (Szasz et al., 2011, p.116). It is possible that instructions used in the previous studies (i.e. Gross, 1998b; Hofman et al., 2009; Szasz et al., 2011) resulted in more socially desirable responses and exaggerated reports of lower levels of distress. However, it may also be possible that the trauma video stimulus in the current study was not upsetting enough in comparison to the anxiety, frustration, and/or anger provoking stimuli used in previous studies.

Attentional Control

Attentional control has recently been highlighted as a protective factor against the development of posttraumatic stress symptoms (e.g. Bardeen et al., 2014). Specifically, the ability to disengage and shift attention has been associated with quicker recovery from trauma-related distress. The current study aimed to further investigate this individual difference in a trauma analogue design that specifically examined core symptoms of posttraumatic stress (i.e. change in mood, intrusions, avoidance). As seen in Tables 4 and 5, regardless of attention shifting ability, participants experienced little change in negative affect from baseline to post-film. These results are in accord with the experience of participants separated by condition; as noted earlier, participants experienced little change in distress regardless of condition. The fact

that participants experienced little change in distress regardless of condition or ability highlights the possibility that the trauma video stimulus lacked potency.

When a median split was used to group individuals based on ability to disengage and shift attention from trauma-related stimuli, individuals with lower attention shifting ability exhibited lower levels of avoidance. However, when considered as a spectrum of ability, this result was no longer significant. This may be a spurious result, as research has shown spurious main effects with the dichotomization of two predictors (for a review of spurious statistical significance following median splits see MacCallum, Zhang, Preacher, & Rucker, 2002 or Maxwell & Delaney, 1993). Given that previous therapy experience was considered a predictor (i.e., a covariate) and was also dichotomous, it is possible that the significant effect of attention may be spurious. Additionally, this may be a result of dichotomizing a variable that is highly skewed (MacCallum et al., 2002). However, it may also reveal important qualitative differences between individuals with lower ability to shift attention and individuals with higher ability to shift attention on trauma-related stimuli. These results suggest that attentional processes are affected by the emotional valence of stimuli (i.e., whether the stimulus is negatively valenced, neutral, or trauma-related), and it is particularly important to consider the stimuli when attempting to use attention training programs.

No differences were found with regard to change in negative affect or intrusions based upon the ability to disengage and shift attention from negatively valenced stimuli. Further, no differences with regard to change in negative affect of intrusions were found based upon ability to disengage and shift attention from trauma-related stimuli. Notably, the patterns of detection latencies (Table 1) appear slightly different than expected, with participants showing less difficulty disengaging from trauma-neutral trials than from neutral-neutral trials. This may be

attributed to reflexive avoidance. Further, participants were only slightly slower to disengage from negative-neutral trials than to disengage from neutral-neutral trials. The dot-probe task used in the current study was adapted from the task used by Salemink and colleagues (2007). The findings from Salemink et al. (2007) show that participants had more difficulty (i.e. were slower) disengaging from threat-neutral trials than from neutral-neutral trials. However, individuals with low trait anxiety in comparison to individuals with high trait anxiety disengaged quicker overall and had slightly less difficulty disengaging from threat-neutral trials than neutral-neutral trials. It appears that the participants in the current study performed similarly to the low trait anxiety participants in Salemink et al.'s (2007) study. Moreover, given that the trauma-related stimuli in the current study were all based upon the film of the motor vehicle accident, it is possible that these terms elicited a response more similar to the neutral terms than to the negative terms prior to watching the film. However, participants' response pattern remained the same after watching the film as well. The dot-probe task will be discussed further as a possible limitation.

Attentional Control and Emotion Regulation

Attentional control was further examined as an individual difference factor that may enhance or deter from the effectiveness of participants' assigned emotion regulation strategy (reappraisal or acceptance). Previous research examining the use of cognitive reappraisal in regulating sadness and the stress of daily life experiences has highlighted the role of attentional control in predicting the effectiveness of this strategy (Malooly et al., 20013; Pe et al., 2013). The current study extended this research by using a trauma analogue design, examining both cognitive reappraisal and acceptance, and by using several measures of distress (i.e. negative

affect, intrusions, and avoidance). Results revealed one significant interaction. When attention shifting ability with negatively valenced stimuli was considered as a spectrum of ability (i.e. tested using a continuous score in a regression-based approach), results showed a significant interaction between attention shifting ability and condition on change in negative affect.

Interestingly, higher attention shifting ability seemed to enhance the effectiveness of acceptance and limit the benefits of cognitive reappraisal. Moreover, individuals with lower levels of attention shifting ability experienced less change in negative affect in the acceptance condition than in the cognitive reappraisal condition. This interaction may account for the lack of main effects shown in the hypotheses, as it suggests there is no overall effect of either condition or attention shifting ability. Rather, the effect of the emotion regulation strategy on change in negative affect is dependent upon level of attention shifting ability. These results provide preliminary support for the importance of individual differences in attentional processes on the effectiveness of treatment strategies used to reduce symptoms. It may be important to account for this difference in treatment planning when considering traditional CBT with cognitive reappraisal or acceptance-based treatments. Given that attentional control can be enhanced through training (e.g., Chiesa, Calati, & Serretti, 2011; Morrison & Chein, 2011), it may be important to consider this training prior to beginning acceptance-based treatments, as it may enhance the effectiveness of the acceptance strategies used.

This is in contrast with previous research indicating that greater ability to disengage from information predicted more effective reappraisal use (Malooly et al., 2013; Pe et al., 2013). This likely reflects differences between the task used in the present study and tasks used in previous studies. As discussed in the introduction, the task used by Malooly and colleagues (2013) focused on task-switching and required participants to disengage from a rule focused on

emotional valence to use a nonemotional rule. The task used by Pe and colleagues (2013) focused on difficulties inhibiting previously relevant information. However, the dot-probe task used in the present study differed slightly from these studies in that it focused on the participants' ability to disengage attention based on the emotional valence of stimuli rather than a competing rule or stimulus. Thus, the task used in the current study may have placed less demand on the resolution process as the participants were not required to inhibit previously relevant rules or information. This may have allowed for a better measure of shifting attention as distinct from affective flexibility or interference resolution.

Given that the current study is the first known study to test an interaction with the dot-probe task focused on disengagement and shifting of attention, rather than affective flexibility or interference resolution (Malooly et al., 2013; Pe et al., 2013), the interaction needs to be replicated in future studies. Additionally, this result must be interpreted with caution since the interaction was not significant when tested using other outcome variables (i.e. intrusions, avoidance) or when tested using attention shifting ability with trauma-related stimuli. This may indicate that the effectiveness of emotion regulation strategies on managing distress is typically independent of the individual's overall ability to shift attention. The overall lack of findings may also be a result of the interaction noted in the introduction between the orienting network and executive network that make up attentional control (Callejas, Lupianez, Funes, & Tudela, 2005; Fan et al., 2009). The current study focused solely on the orienting network; however, it is possible that the effect of the mental operations in this network (i.e. disengagement and shifting) on emotion regulation strategies is dependent upon the processing and awareness functions of the executive network. Future research may benefit from examining abilities related to both networks.

Limitations and Future Directions

There are several limitations to the present study that should be addressed in future research. Cronbach and Meehl (1955) have argued that limitations to construct validity and theory testing may be a result of inadequate theories, measures, or both. The current study relied on the framework provided by Gross' (1998a) original process model of emotion regulation. While the current study focused on families of emotion regulation processes (i.e. attentional deployment, cognitive change, and response modulation) as highlighted in the original process model, Gross's (2015a) extended process model changed focus to primarily emphasize the importance of the various elements of regulatory stages. This may indicate that distinctions between the strategies common to these families may be unclear unless examined with regard to the regulatory stage. For example, difficulties with attentional deployment at the identification stage may result in different outcomes than difficulties with attentional deployment at the implementation stage. Thus, the fact that no group differences were observed for many of the outcomes may be a result of the theoretical framework as Cronbach and Meehl (1955) have suggested. Future research would benefit from considering the regulatory stages at which the processes investigated in the current study occur.

The methods and measures used in the current study may also be limited. As Cronbach and Meehl (1955) noted, the measures may not have been adequate assessments of the constructs. As noted, the dot-probe task in the current study differed from those used in previous studies of attentional control and emotion regulation (e.g., Pe et al., 2013). While it is possible that the task used in the current study may be a better indicator of disengagement and shifting, the task may have benefited from the use of pictorial stimuli rather than word stimuli. Research

has illustrated that pictures may be more strongly related to affective information than words and may be better approximations of real-world cues (De Houwer & Hermans, 1994). Further, word stimuli require a greater amount of semantic processing (Pineles et al., 2009) than pictures, which may prolong processing and possibly increase error variance. Moreover, the participants in the current study did not rate the valence of the word stimuli used. The stimuli were identified from the ANEW list (Bradley & Lang, 1999) consistent with previous research. It would have been ideal to use stimuli with valence ratings given by the participants; however, this may have primed the participants and reduced the arousal associated with the stimuli. Moreover, the standard deviations for the attention shifting ability scores were quite large as these scores were significantly skewed, indicating a wide range in participants' ability to shift attention.

As discussed, it is possible that the trauma video stimulus was not potent enough to produce a negative affective state that would have benefited from the use of emotion regulation strategies. While previous research has effectively used similar distressing film clips in trauma analogue designs in order to induce short-term distress (e.g., Dunn et al., 2009; Olsen & Beck, 2012), this film may have been less effective as a result of the sample's familiarity with motor vehicle accidents. The fact that 21.2% of participants who attended the first session were excluded due to self-reported experiences of severe motor vehicle accidents may indicate that the current sample was exposed to a high frequency of motor vehicle accidents. In comparison, Frazier and colleagues (2009) found that 17% of undergraduate students reported exposure to motor vehicle accidents in a large sample (N = 1,528). Moreover, high exposure to graphic and severe images through video games, Internet phenomenon, and the media, which was not measured in the current study, may detract from the arousal caused by the trauma video stimulus. Thus, future research may benefit from using a different trauma video stimulus that is not

focused on a motor vehicle accident and is shown to induce a greater (though manageable) level of arousal.

It is also possible that the measures used in the current study to assess distress were limited. In particular, the compliance rate for the intrusion diary was extremely low. The intrusion diary in the current study used an electronic format and was supplemented with reminder emails and text messages. While there is much debate in the literature about the data equivalence of paper diaries in comparison to electronic diaries (e.g. Green, Rafaeli, Bolger, Shrout, & Reis, 2006), future studies may benefit from the use of paper diaries. It is likely that motivation to complete the electronic diaries was low since participants were not required to bring in copies of the diaries in order to receive participation credit. Moreover, it may be useful to combine methods and have the participant complete both formats. Additionally, avoidance was assessed using a measure created for this study. Future research using this measure is warranted to support its validity and reliability. Avoidance may also be better measured using behavioral indicators and future research may benefit from eye-tracking or video-taping participants to code avoidance behavior in conjunction with self-reported avoidance.

Similarly, the use of a college sample limits the generalizability of the results. The participants in this sample were from a relatively high functioning population, which may impact understanding of the emotion regulation instructions. The instructions were given a maximum of two times, which may only have been sufficient training for high functioning populations. Moreover, participants who were excluded were older and reported a higher frequency of traumatic events than participants in the final sample. It is unknown whether the results of this study will generalize to community or clinical populations. Sampling from community or clinical populations in the future may enhance generalizability of results.

Conclusion

Although many of the proposed hypotheses were not substantiated, two interesting findings emerged from this study. Firstly, it was found that individuals with lower attention shifting ability with regard to trauma-related stimuli exhibited lower levels of avoidance than individuals with higher attention shifting ability. This result may substantiate previous research regarding exposure based treatment that indicates that more exposure to trauma-related stimuli is associated with lower levels of avoidance (e.g. Foa & Kozak, 1986). These results also highlight that attentional processes are affected by the emotional valence of stimuli. Thus, attention training programs may benefit from additional consideration of the valence of stimuli. Secondly, it was discovered that the effect of the emotion regulation strategy on change in negative affect is opposite, depending on level of attention shifting ability with regard to negatively valenced stimuli. These results are important to consider when treatment planning, as acceptance-based treatments may be more beneficial for individuals with higher levels of attentional control. Given the limitations of this study, replication and improvement in methodology would allow for further understanding of the impact of attentional processes in the effectiveness of emotion regulation strategies on managing distress.

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APPENDIX A

DEMOGRAPHIC QUESTIONNAIRE

To help us interpret the results of this survey, we would like to ask you a few general questions:

1. Your sex:
   a) Male
   b) Female

2. Your current age ____

3. Your ethnic background:
   a) African-American/Black
   b) Caucasian- Non-Hispanic
   c) Asian-American/Pacific Islander
   d) Hispanic
   e) Multiethnic (Specify:_____)
   f) Other (Specify:_____)

4. Your marital status:
   a) Single (never married)
   b) In a relationship, not married, not living together
   c) In a relationship, living together
   d) Married
   e) Separated
   f) Divorced
   g) Widowed

5. Your estimated household (family) income last year_____

6. Your estimated income last year_____

APPENDIX B

EMOTION REGULATION QUESTIONNAIRE

We would like to ask you some questions about how you **typically** control (that is, regulate and manage) your emotions. For each item, please answer using the following scale:

1	**2**	**3**	**4**	**5**	**6**	**7**
Strongly Disagree			**Neutral**			**Strongly Agree**

1. ____ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about.*

2. ____ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about.*

3. ____When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.

4. ____When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.

5. ____ I control my emotions by *changing the way I think* about the situation I'm in.

6. ____When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.

APPENDIX C

DIFFICULTIES IN EMOTION REGULATION SCALE (DERS)

Please indicate how often the following statements apply to you …

1.) When I'm upset, I become angry with myself for feeling that way

Almost Never (0%-10%) | Sometimes (11%-35%) | About Half the Time (36%-56%) | Most of the Time (66%-90%) | Almost Always (91%-100%) | Prefer Not to Respond

2.) When I'm upset, I become embarrassed for feeling that way

Almost Never (0%-10%) | Sometimes (11%-35%) | About Half the Time (36%-56%) | Most of the Time (66%-90%) | Almost Always (91%-100%) | Prefer Not to Respond

3.) When I'm upset, I feel ashamed with myself for feeling that way

Almost Never (0%-10%) | Sometimes (11%-35%) | About Half the Time (36%-56%) | Most of the Time (66%-90%) | Almost Always (91%-100%) | Prefer Not to Respond

4.) When I'm upset, I feel like I am weak

Almost Never (0%-10%) | Sometimes (11%-35%) | About Half the Time (36%-56%) | Most of the Time (66%-90%) | Almost Always (91%-100%) | Prefer Not to Respond

5.) When I'm upset, I feel guilty for feeling that way

Almost Never (0%-10%) | Sometimes (11%-35%) | About Half the Time (36%-56%) | Most of the Time (66%-90%) | Almost Always (91%-100%) | Prefer Not to Respond

6.) When I'm upset, I become irritated with myself for feeling that way

Almost Never (0%-10%) | Sometimes (11%-35%) | About Half the Time (36%-56%) | Most of the Time (66%-90%) | Almost Always (91%-100%) | Prefer Not to Respond

APPENDIX D

TRAUMATIC LIFE EVENTS QUESTIONNAIRE (TLEQ)

The purpose of this questionnaire is to identify important life experiences that can affect a person's emotional well-being or later quality of life. The events listed below are far more common than people realize. Please read each question carefully and mark the answers that best describe your experience.

1. Have you ever experienced a natural disaster (a flood, hurricane, earthquake, etc.)?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no
Were you seriously injured? yes/no
Was someone you cared about or close by seriously injured or killed? yes/no
Do you think you or a loved one was in danger of being killed by the disaster? yes/no

2. Were you involved in a motor vehicle accident for which you received medical attention or that badly injured or killed someone?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no
Were you seriously injured? yes/no

3. Have you been involved in any other kind of accident where you or someone else was badly hurt?
(examples: a plane crash, a drowning or near drowning, an electrical or machinery accident, an explosion, home fire, chemical leak, overexposure to radiation or toxic chemicals)

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no
Were you seriously injured? yes/no

4. Have you ever lived, worked, or had military service in a war zone? yes/no
If yes, were you ever exposed to warfare or combat? (for example: in the vicinity of a rocket attack or people being fired upon; seeing someone get wounded or killed)

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

If this happened:

Did you experience intense fear, helplessness, or horror when it happened? yes/no
Were you seriously injured? yes/no

5. Have you ever experienced the sudden or unexpected death of a close friend or loved one?

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

Due to accident? yes/no illness? yes/no suicide? yes/no murder? yes/no

If his happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

6. Has a loved one ever survived a life threatening or permanently disabling accident, assault, or illness? (examples: spinal cord injury, rape, cancer, life threatening virus)

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

7. Have you ever had a life threatening illness?

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

8. Have you been robbed or been present during a robbery-where the robber(s) used or displayed a weapon?

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no
Were you seriously injured? yes/no

9. Have you been hit or beaten up and badly hurt by a stranger or by someone you didn't know very well?

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no
Were you seriously injured? yes/no

10. Have you seen a stranger (or someone you didn't know very well) attack or beat up someone and seriously injure or kill them?

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no
11. Has anyone threatened to kill you or cause you serious physical harm?

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

stranger? yes/no friend or acquaintance? yes/no relative? yes/no
intimate partner? yes/no

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

12. While you were growing up: Were you physically punished in a way that resulted in bruises, burns, cuts, or broken bones?

never__ once__ twice__ 3 times__ 4 times__ 5 times___
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

13. While growing up: Did you see or hear family violence? (such as your father hitting your mother, or any family member beating up or inflicting bruises, burns or cuts on another family member)

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

14. Have you ever been slapped, punched, kicked, beaten up, or otherwise physically hurt by your spouse (or former spouse), a boyfriend/girlfriend, or some other intimate partner?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

If this happened?
Did you experience intense fear, helplessness, or horror when it happened? yes/no
Were you seriously injured? yes/no
Has more than one intimate partner physically hurt you? yes/no
If yes, how many hurt you? _____

15. Before your 13th birthday: Did anyone – who was at least 5 years older than you – touch or fondle your body in a sexual way or make you touch or fondle their body in a sexual way?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

Was the person a stranger? yes/no friend or acquaintance? yes/no parent or caregiver? yes/no
Other relative? yes/no
Was threat or force used? yes/no
Were you seriously injured? yes/no
Was there oral, anal, or vaginal penetration? yes/no
If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

16. Before your 13th birthday: Did anyone close to your age touch sexual parts of your body or make you touch sexual parts of their body – against your will or without your consent?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

Was the person a stranger? yes/no friend or acquaintance? yes/no relative? yes/no
Was threat or force used? yes/no
Were you seriously injured? yes/no
Was there oral, anal, or vaginal penetration? yes/no

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

17. After your 13th birthday and before your 18th birthday: Did anyone touch sexual parts of your body or make you touch sexual parts of their body – against your will or without your consent?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

stranger? yes/no friend or acquaintance? yes/no relative? yes/no intimate partner? yes/no
Was threat or force used? yes/no
Were you seriously injured? yes/no
Was there oral, anal, or vaginal penetration? yes/no

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

18. After your 18th birthday: Did anyone touch sexual parts of your body or make you touch sexual parts of their body – against your will or without your consent?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

stranger? yes/no friend or acquaintance? yes/no relative? yes/no intimate partner? yes/no
Was threat or force used? yes/no
Were you seriously injured? yes/no
Was there oral, anal, or vaginal penetration? yes/no

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

19. Were you ever subjected to uninvited or unwanted sexual attention (other than sexual contact discussed in previous questions)?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

If yes, was this person a:
Stranger? Yes / No Friend or acquaintance? Yes/No Relative? Yes/ No
Supervisor or coworker? Yes/No

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

20. Has anyone ever stalked you – in other words: followed you or kept track of your activities – causing you to feel intimidated or concerned for your safety?

never__ once__ twice__ 3 times__ 4 times__ 5 times__ more than 5 times__

stranger? yes/no friend or acquaintance? yes/no relative? yes/no intimate partner? yes/no

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

21. Have you or a romantic partner ever had a miscarriage?

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no
Did it (ever) happen after you were physically injured? yes/no

22. Have you or a romantic partner ever had an abortion?

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no

23. Have you ever experienced (or seen) any other events that were life threatening, causing serious injury, or were highly disturbing or distressing? (examples: lost in the wilderness; a serious animal bite, violent death of a pet; being kidnapped or held hostage; seeing mutilated body or body parts)

never__ once__ twice__ 3 times__ 4 times__ 5 times__
more than 5 times__

If this happened:
Did you experience intense fear, helplessness, or horror when it happened? yes/no
Were you seriously injured? yes/no

APPENDIX E

PTSD CHECKLIST - 5 (PCL-5)

This questionnaire asks about problems you may have had after a very stressful experience involving *actual* or *threatened death*, *serious injury*, or *sexual violence*. It could be something that happened to you directly, something you witnessed, or something you learned happened to a close family member of close friend. Some examples are a *serious accident; fire; disaster such as a hurricane, tornado, or earthquake; physical* or *sexual attack* or *abuse; war; homicide;* or *suicide*.

First, please answer a few questions about your *worst event*, which for this questionnaire means the event that currently bothers you the most. This could be one of the examples above or some other very stressful experience. Also, it could be a single event (for example, a car crash) or multiple similar events (for example, multiple stressful events in a war-zone or repeated sexual abuse).

*Briefly identify the worst event:*_____

How long ago did it happen? _____ (please estimate if you are not sure)

Did it involve actual or threatened death, serious injury, or sexual violence?

____Yes
____No

How did you experience it?

____It happened to me directly
____I witnessed it
____I learned about it happening to a close family member or close friend
____I was repeatedly exposed to details about it as part of my job (for example, paramedic, police, military, or other first responder)
____Other, please describe _____

If the event involved the death of a close family member or close friend, was it due to some kind of accident or violence, or was it due by natural causes?

____Accident or violence
____Natural causes
____Not applicable (the event did not involve the death of a close family member or close friend).

Second, keeping this worst event in mind, read each of the problems on the next page and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

In the past month, how much were you bothered by:	***Not at all***	***A little bit***	***Moderately***	***Quite a bit***	***Extremely***
1. Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2. Repeated, disturbing dreams of the stressful experience?	0	1	2	3	4
3. Suddenly feeling or acting as if the stressful experience were actually happening again *(as if you were actually back there reliving it)*?	0	1	2	3	4
4. Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5. Having strong physical reactions when something reminded you of the stressful experience *(for example, heart pounding, trouble breathing, sweating)*?	0	1	2	3	4
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	0	1	2	3	4
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8. Trouble remembering important parts of the stressful experience (for some reason besides a head injury or alcohol/drug use)?	0	1	2	3	4
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	0	1	2	3	4
10. Blaming yourself or someone else (who didn't directly cause the event or actually harm you) for the stressful experience or what happened after it?	0	1	2	3	4

11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0	1	2	3	4
12. Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13. Feeling distant or cut off from other people?	0	1	2	3	4
14. Having trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15. Feeling irritable or angry or acting aggressively?	0	1	2	3	4
16. Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17. Being “superalert” or watchful or on guard?	0	1	2	3	4
18. Feeling jumpy or easily startled?	0	1	2	3	4
19. Having difficulty concentrating?	0	1	2	3	4
20. Trouble falling or staying asleep?	0	1	2	3	4

APPENDIX F

POSITIVE AND NEGATIVE AFFECT SCHEDULE (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. **Indicate to what extent you feel this way right now, that is, at the present moment.**

	Very Slightly or Not at All	A Little	Moderately	Quite a Bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

APPENDIX G

AVOIDANT TENDENCIES MEASURE

Please answer the following statements to the best of your ability using the scales provided.

1. Please estimate how often you **looked away** from the film clip.

   0 1 2 3 4 5

   Not At All Very Often

2. Please estimate how often you **attempted to disengage** from the film clip.

   0 1 2 3 4 5

   Not At All Very Often

3. How willing are you to be contacted for **additional paid experimental research** in which you would be asked to view other film clips **depicting vehicular accidents**?

   0 1 2 3 4 5

   Not At All Willing Very Willing

4. How willing are you to be contacted for **additional paid experimental research** in which you would be asked to view other film clips **that may elicit similar emotional reactions?**

   0 1 2 3 4 5

   Not At All Willing Very Willing

APPENDIX H

MANIPULATION CHECK FOR COGNITIVE REAPPRAISAL CONDITION

Please rate to what extent you agree with the following statements, using the scale below.

0	1	2	3	4	5
Not At All					Very Much

1. While viewing this film, I was able to recognize my thoughts and consider different ways of thinking about the film. 0 1 2 3 4 5

2. While viewing this film, I was able to influence my emotional reactions by thinking in a certain way about the content of the film-clips. 0 1 2 3 4 5

APPENDIX I

MANIPULATION CHECK FOR ACCEPTANCE CONDITION

Please rate to what extent you agree with the following statements, using the scale below.

0	1	2	3	4	5
Not At All					Very Much

1. While viewing this film, I allowed my emotional reactions to follow their natural course, and observed my emotions as they unfolded. 0 1 2 3 4 5

2. While viewing this film, I was able to accept my emotional reactions without trying to control, change, or avoid them. 0 1 2 3 4 5

APPENDIX J

IMPACT OF EVENT SCALE - REVISED

Below is a list of difficulties people sometimes have after stressful events. Please read each item, and then indicate how distressing each difficulty has been for you **DURING THE PAST SEVEN DAYS** with respect to the film you watched in the first research session. How much were you distressed or bothered by these difficulties?

0 = Not at all; 1 = A little bit; 2 = Moderately; 3 = Quite a bit; 4 = Extremely

1. Any reminder brought back feelings about the film.	0 1 2 3 4
2. I had trouble staying asleep.	0 1 2 3 4
3. Other things kept making me think about the film.	0 1 2 3 4
4. I felt irritable and angry.	0 1 2 3 4
5. I avoided letting myself get upset when I thought about the film or was reminded of it.	0 1 2 3 4
6. I thought about the film when I didn't mean to.	0 1 2 3 4
7. I felt as if watching the film hadn't happened or wasn't real.	0 1 2 3 4
8. I stayed away from reminder of the film.	0 1 2 3 4
9. Pictures about the film popped into my mind.	0 1 2 3 4
10. I was jumpy and easily startled.	0 1 2 3 4
11. I tried not to think about the film.	0 1 2 3 4
12. I was aware that I still had a lot of feelings about the film, but I didn't deal with them.	0 1 2 3 4
13. My feelings about the film were kind of numb.	0 1 2 3 4
14. I found myself acting or feeling like I was back watching the film.	0 1 2 3 4
15. I had trouble falling asleep.	0 1 2 3 4
16. I had waves of strong feelings about the film.	0 1 2 3 4
17. I tried to remove the film from my memory.	0 1 2 3 4
18. I had trouble concentrating.	0 1 2 3 4
19. Reminders of the film caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.	0 1 2 3 4
20. I had dreams about the film.	0 1 2 3 4
21. I felt watchful and on-guard.	0 1 2 3 4
22. I tried not to talk about the film.	0 1 2 3 4

APPENDIX K

INTRUSIONS DIARY TEMPLATE

Following films that produce emotional reactions, such as the one you watched today, people often experience ***spontaneously occurring memories of the traffic safety film***. There is much variation in the amount of intrusive memories people experience.

Please record any memories you experience of the film as soon as possible using the following questions. Please note that there may be days in which you experience no spontaneously occurring memories of the film.

Describe the content of the intrusion: _____

Was there something that triggered the intrusion (please choose one): Yes No

If yes, what was the trigger:_____

Please circle what best describes how you experienced the intrusion:

a) an image b) a thought c) a sound d) a feeling/emotion e) something else:_____

How **vivid** was the intrusion:

_____

0 (not at all) 100 (very vivid)

How much **distress** did you experience:

_____

0 (not at all) 100 (very vivid)