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An evaluation of changes in cognitive appraisal and emotion regulation in the treatment of PTSD in individuals with severe mental illness

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A Dissertation

entitled

An Evaluation of Changes in Cognitive Appraisal and Emotion Regulation in the
Treatment of PTSD in Individuals with Severe Mental Illness

By

Alisha Lee, MA

Submitted to the Graduate Faculty as partial fulfillment of
the requirements for the Doctor of Philosophy Degree in Psychology

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August 2015

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An Abstract of

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The primary theories (Ehlers & Clark, 2000; Foa & Kozak, 1986) concerning the development and maintenance of posttraumatic stress disorder (PTSD) are cognitive in nature. Subsequently, the front-line treatments for PTSD have been cognitive behavioral treatments; however, research examining the efficacy of these treatments has largely excluded individuals with serious mental illness (SMI) as participants. Thus, research on treatments for PTSD in individuals with SMI is limited, and only cognitive treatments for this population have been examined (Frueh et al., 2009; Mueser et al., 2008). Recent literature (Ehring & Quack, 2010; Price, Monson, Callahan, & Rodriguez, 2006) has emerged demonstrating that programs focused on improving emotion regulation (ER) in individuals who have PTSD are effective (Kearney et al., 2012; Kimbrough et al., 2010); however, research is still lacking concerning the use of this treatment modality with individuals with comorbid PTSD and SMI.

Wellness Management and Recovery (WMR), a psychoeducational group program aimed at promoting mental health recovery in individuals with SMI has recently

been evaluated and determined to be associated with reductions in PTSD in individuals who have completed the program (Lee, 2011). However, the mechanisms through which WMR works remain unclear. As a result, the purpose of the current study was to utilize self-report measures of PTSD symptoms, cognitive appraisal of a traumatic event, and ER to determine whether or not WMR's impact on trauma-related beliefs or ER significantly predicted participants' reduction in PTSD symptoms.

Results of the present study demonstrated that following participation in WMR, individuals' self-reported levels of PTSD symptoms, trauma-related cognitions, and ER difficulties decreased. Regression analyses revealed that both changes in cognition and ER predicted changes in participants' self-reported levels of PTSD symptoms; however, changes in ER were found to be the superior predictor, predicting 18% more of the variance in change in PTSD symptoms than did changes in trauma-related cognitions. The results of this study suggest that PTSD treatments developed for individuals with SMI may be most effective if interventions aimed at increasing ER skills are integrated into treatment protocols.

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Chapter One

Introduction

Research on the role of cognition in the maintenance and development of PTSD has dominated the literature for the past few decades in both individuals with and without serious mental illness (SMI; Ehlers & Clark, 2000; Foa & Kozak, 1986; Mueser et al., 2008). Subsequently, the front-line treatments for PTSD (i.e., Prolonged Exposure and Cognitive Processing Therapy) have been cognitive behavioral treatments based on these theories, and there have been a large number of research studies that have demonstrated the efficacy of these treatments (Foa & Rauch, 2004; Resick et al., 2008) for the treatment of PTSD. However, a majority of these studies have SMI as an exclusion criterion. Although the research on treatments for individuals with comorbid PTSD and SMI is limited, those treatment programs studied and demonstrated to be effective with this population also have been cognitive behavioral treatments (Frueh et al., 2009; Mueser et al., 2008).

Recent research has identified emotion regulation as another important factor that can have a positive impact on PTSD symptoms when enhanced in individuals undergoing treatment for the disorder (Kimbrough, Magyar, Langenberg, Chesney, & Berman, 2010). However, little research has explored the contribution of emotion regulation to PTSD symptomatology in individuals with SMI. This exploration is required in order to increase the evidence-based treatment options for individuals with comorbid PTSD and SMI.

More recently, research has determined that Wellness Management and Recovery (WMR) is associated with reductions in PTSD in individuals who have completed the

program (Lee, 2011). This recovery-focused group treatment program for individuals with SMI, based on principles of evidenced-based treatments—including modeling, peer support, and motivational interviewing—significantly differs from cognitively-focused treatments used with individuals with SMI for PTSD. Specifically, the positive impact of WMR has been described as coming as much from the *process of doing* WMR and the *core values* that are promoted by this process (e.g., holistic health, strengths-based, peer support, and recovery centric) as much as the content of the material provided in the WMR manual (Wellness Management and Recovery Coordinating Center of Excellence; website: <http://wmrohio.org>, 2012). However, the mechanisms through which WMR works—reducing negative cognitive appraisals of a traumatic event or enhancing emotion regulation skills—to support the reduction of participants’ PTSD symptoms remain unclear. As a result, the purpose of the present study was to utilize self-report measures of PTSD, cognitive appraisal of a traumatic event, and emotion regulation to determine whether or not WMR’s impact on trauma-related beliefs or emotion regulation significantly predicted participants’ reductions in PTSD symptoms.

The following chapters will provide a review of the literature on the theories underlying the front-line treatments of PTSD in individuals both with and without SMI, including Prolonged Exposure (PE) and Cognitive Processing Therapy (CPT). Following this discussion, emerging research on the role of emotion regulation in the maintenance and treatment of PTSD will be discussed. Additionally, research will be reviewed that suggests that WMR successfully promotes recovery in individuals with SMI and that a reduction in PTSD symptoms is often a component of this recovery. Research that has explored the negative impact of PTSD on individuals with SMI also will be discussed in

order to highlight the importance of better identifying the mechanisms through which PTSD symptomatology can be alleviated in individuals with SMI. Following this review of the literature, study methods will be described and results presented. The paper will conclude with a discussion of study implications, limitations and directions for future research.

Chapter Two

Literature Review

Conceptualization and Treatment of PTSD

Posttraumatic stress disorder (PTSD) has been conceptualized as that which occurs when the natural recovery process is disrupted following a traumatic event (Foa & Kozak, 1986). The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., DSM-5; American Psychiatric Association, 2013) describes a traumatic event as occurring when a person experiences an actual or threatened death or serious injury or sexual violence. This may occur by individuals experiencing the event themselves, witnessing such an event happening to another person, learning that such an event happened to a close family member or friend, or experiencing repeated or extreme exposure to aversive details of a traumatic event. Furthermore, the DSM-5 indicates that in order for an individual to be diagnosed with PTSD, he or she must also experience the following symptoms: reexperiencing the event in some way, avoiding stimuli associated with the event, exhibiting hyperarousal, and experiencing negative alterations in mood or cognitions associated with the event (American Psychiatric Association, 2013). Data gleaned from large-scale national surveys indicate that 58% of the general population has experienced a traumatic stressor; however, these studies report that the lifetime prevalence rate for PTSD in the general population is 6-8% (Kessler, Chiu, Dembler, & Walters, 2005; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Pietrzak, Goldstein, Southwick & Grant, 2011).

Cognitive theories of PTSD. Given that only a small proportion of individuals who have experienced a traumatic event develop PTSD, researchers have sought to

explain what contributes to the development and maintenance of PTSD as a disorder of non-recovery. Two theories, primarily focused on trauma-related cognitions, have emerged in the past 25 years as having the most explanatory power in this domain. One such theory was developed by Ehlers and Clark (2000) and is known as the cognitive model of PTSD. In this model, the authors propose that the way individuals process a traumatic event causes them to experience a sense of current threat, which maintains their PTSD symptoms. Specifically, the authors contend that this sense of current threat is the consequence of two main processes—the individual’s appraisal of the traumatic event and the storage of the memory of the event, including its connection to other autobiographical memories. Relative to the appraisal of the event, Ehlers and Clark provide examples to elucidate the manner in which negative appraisals can create a sense of current threat. The authors explain that individuals may overgeneralize from the event, causing them to think that even safe situations are dangerous. For example, a woman who was raped by a man may develop the belief that all men want to hurt her. Avoidance may then be used as a means to defend against perceived threats to safety, which serves to maintain the current sense of threat. The authors note that not only the appraisals of the event itself are important but also the negative appraisals of situations, reactions, or behaviors which follow the traumatic event. For example, individuals may appraise a family member’s unsupportive response to their trauma as an indication that it was their fault that the trauma took place.

Ehlers and Clark’s (2000) model also provides a rationale for the role of memory storage of the event and its relationship to individuals’ with PTSD tendency to have difficulty intentionally recalling the event and inhibiting the unintentional recall of the

event (i.e., reexperiencing the event). According to the authors, the major problem occurs when the “trauma memory is poorly elaborated and inadequately integrated into its context in time, place, subsequent and previous information and other autobiographical information” (Ehlers & Clark, 2000, p. 325). Ehlers and Clark suggest that individuals’ inability to associate the traumatic memory with a particular time and place in the past explains why they find it difficult to intentionally recall details of the event and experience a sense of current threat when the memory is triggered. According to Ehlers and Clark, the processes of appraising the event and encoding it in memory are not independent of one another because there is a reciprocal relationship between them in which individuals’ initial negative appraisals cause them to recall only aspects of the traumatic event that are consistent with their appraisals from memory. Additionally, the authors note the possibility that the inability to fully remember details of the traumatic event can spur negative appraisals as to why the event cannot be remembered (i.e., that the trauma was too horrific for them to be able to cope with what actually happened).

Further complicating the picture, according to the cognitive model of PTSD, are individuals’ tendency to engage in behavioral strategies that prevent the maladaptive cognitions resulting from the appraisal and storage in memory of the event from being disrupted (Ehlers & Clark, 2000). For example, individuals often develop safety behaviors which prevent them from obtaining information that disconfirms their maladaptive belief that a catastrophe will take place. In relation to the trauma memory, individuals often actively prevent themselves from thinking about the traumatic event by occupying their minds with other things. Ehlers and Clark contend that this prevents individuals from recalling the trauma memory in a manner that takes into account the

circumstances surrounding the event as well as the time during which the event occurred. Within the context of their model, Ehlers and Clark argue that that treatment of PTSD should focus on elaborating and integrating the trauma memory into its appropriate context, modifying the maladaptive negative appraisals the individual holds about the traumatic event, and modifying behaviors which prevent the prior two goals from being accomplished.

Another prominent explanatory theory of PTSD is based on emotional processing theory (Foa & Kozak, 1986). In this theory, it is posited that in order for fear to be reduced, the fear memory must first be activated and then new information must be provided that is incongruent with the way the individual recalls and conceptualizes the memory as part of their fear structure. This allows a new memory to be formed and integrated into the fear structure so that this cognitive information can facilitate emotional change. Foa and Rothbaum (1998) identified two maladaptive cognitions associated with the fear structure of the traumatic event that must be modified by the introduction of new information in order to decrease PTSD symptoms. Specifically, they contend that individuals view the world as being completely unsafe and themselves as completely incompetent. Foa and Rothbaum suggested that individuals may develop these cognitions through one of two ways. Individuals may have difficulty incorporating the information gained from the traumatic event with prior beliefs and as a result, overaccommodate their beliefs about themselves and the world in order to fit with their memory of the event. Alternatively, if individuals held negative views about themselves or the world prior to the traumatic event, the event may serve to reinforce these existing beliefs (Foa and Rothbaum, 1998).

Empirical support for the role of cognition in PTSD. These theories have led both research on and treatment of PTSD to focus on the role of cognition in the amelioration of this disorder. For example, Foa, Ehlers, Clark, Tolin, and Orsillo (1999) developed the Posttraumatic Cognitions Inventory (PTCI) as a means to assess for trauma-related beliefs regarding how an individual views the world and themselves as well as beliefs concerning self-blame. The researchers utilized 601 individuals seeking treatment for posttraumatic stress symptoms, volunteers who responded to a newspaper advertisement, and college undergraduates. Of these individuals, 65% reported at least one traumatic event. The items for this measure were based on the theories which predominated at the time the study was conducted as well as clinical interviews with trauma survivors.

The researchers of this study reported a three-factor structure for the PTCI, which included negative beliefs about the self, negative beliefs about the world, and self-blame for the traumatic event. Their report of the validation of this measure indicated that trauma-related cognitions, as measured by the PTCI, did differentiate those individuals who had experienced a trauma and had PTSD from those individuals who had experienced a trauma but did not have PTSD and those who had not experienced a trauma. According to the authors, traumatized and non-traumatized individuals without PTSD did not differ on this measure. In sum, individuals diagnosed with PTSD had more negative beliefs about themselves, the world, and attitudes about self-blame than the other two groups, suggesting that cognition plays an important role in the development and maintenance of PTSD.

Park, Mills, and Edmonson (2012) sought to more closely examine cognitive theories of PTSD by determining how PTSD symptomatology is impacted by the extent to which appraisals of a traumatic event violate one's global meaning system. More specifically, the authors examined how goal and belief violations, views about the self and the world, and PTSD symptom severity were related in a sample of 130 undergraduate students from a Northeast university who had experienced at least one traumatic event. The authors reported that the more individuals believed that a traumatic event violated their meaning system, the more severe their PTSD symptoms. Park et al. (2012) also found that negative views of the self were strongly related to PTSD symptom severity. However, the authors found that individuals' negative beliefs about the self and the world mediated the relationship between global meaning violations and PTSD symptoms, highlighting the important role of cognitions about the self and world in the disorder. Owens, Pike, and Chard (2001) also illustrated the relationship between cognitive distortions pertaining to safety, trust, power, esteem and intimacy and PTSD in their sample of 52 female survivors of childhood sexual abuse. They reported that more severe negative beliefs concerning these five themes were significantly associated with more PTSD symptoms prior to beginning PTSD treatment, immediately following PTSD treatment, three months following treatment, and one year after treatment.

Treatments for PTSD thought to impact cognition. Many popular treatments for PTSD and the subsequent research on the effectiveness of these treatments also highlight the importance of cognition in the development and maintenance of PTSD. According to the practice guidelines from the International Society for Traumatic Stress studies (ISTSS) (Foa, Keane, Friedman, & Cohen, 2009), exposure therapy has gained

the most support as an efficacious treatment for PTSD. More specifically, Prolonged Exposure (PE) (Foa, Hembree, & Rothbaum, 2007) is one of only two psychotherapies that are currently being widely disseminated by the Veterans Affairs (VA) (Karlin et al., 2011). Furthermore, a recent meta-analysis (Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010) demonstrated that PE outperformed control conditions on both primary (e.g., those that measured PTSD symptoms) and secondary (i.e., depression and quality of life ratings) measures of PTSD. PE was developed based on the principles of emotional processing theory (Foa & Kozak, 1986), described above. PE is comprised of four main components (i.e., psychoeducation, breathing retraining, imaginal exposure, in vivo exposure), which are implemented or discussed in a manualized fashion across 8-15, 90 minute sessions (Foa et al. 2007; Sharpless & Barber, 2011). First, both psychoeducation about PTSD and common reactions to trauma are presented and breathing retraining is taught in order to provide the individual with an effective way to cope with day-to-day anxiety. Treatment then shifts to focus on the two core components of PE—in vivo exposure and imaginal exposure. In vivo exposure is the exposure to safe situations that the client avoids due to trauma-related fears. Imaginal Exposure involves the client recounting the trauma memory aloud in as much detail as possible. The account is audio recorded, and the client is instructed to listen to the account every day in between sessions (Foa et al., 2007). Through the use of these components, individuals are able to habituate to the trauma memory as well as to the anxiety they experience when in situations they have avoided due to trauma-related fears (e.g., fear that if in a busy store, they may be harmed).

Although PE is based on the premise that individuals must confront their feared situations in a safe manner in order to overcome their anxiety and the idea that the memory of the trauma must be successfully processed in order to relieve PTSD symptoms, changes in cognitive appraisals do appear to play a role in the efficacy of this treatment. Foa and Rothbaum (1998) contend that while cognitions are not directly addressed in this treatment, when individuals engage in imaginal or in vivo exposure, they are presented with new information which disconfirms their trauma-related cognitions concerning the incompetence of the self, the world as an unsafe place, and self-blame. This idea is supported by outcome studies which have been conducted to determine the efficacy of this treatment. For example, Foa and Rauch (2004) reported that PE resulted in a significant reduction in self-reported level of maladaptive trauma related cognitions. These results were reported with a sample of 27 women who had been the victim of a sexual or nonsexual assault, had a primary diagnosis of PTSD, and did not meet exclusion criteria of having schizophrenia, bipolar disorder, or a substance abuse disorder. The authors reported that the women's reductions in negative trauma-related beliefs were maintained at a 12-month follow-up. Furthermore, this reduction in negative cognitions was significantly associated with a reduction in PTSD symptom levels. As part of their study, Foa and Rauch also randomly assigned some participants to receive PE plus a cognitive restructuring component from five doctoral level clinicians. They reported that combining PE with a cognitive restructuring component did not increase the effectiveness of the treatment on PTSD symptomatology.

Similarly, Hagedaars, Van Minnen, and De Rooij (2010) examined the efficacy of PE with 77 individuals who met criteria for PTSD, were not suicidal, did not have

substance dependence or a psychotic disorder, and were receiving services at an outpatient clinic. According to the authors, each clinician was supervised and fidelity checks were made following each session. Hagenaars et al. found that individuals reported significant decreases in their negative appraisals about themselves, the world, and in relation to self blame. Additionally, the authors reported that individuals' self-reported decrease in negative appraisals was significantly correlated with their changes in PTSD symptoms. These findings indicate that providing individuals with information that disconfirms their trauma-related cognitions is sufficient for decreasing these cognitions and for the successful treatment of PTSD, even if cognitions are not directly addressed. While these studies may not fully support the direct relationship between the decrease of trauma-related cognitions and a reduction in PTSD symptoms, cognition does appear to play an important role in the treatment of PTSD.

Powers et al.'s (2010) meta-analysis examining the efficacy of the PE utilized 13 studies with a total of 675 participants. Powers et al. found that PE was significantly more effective at reducing PTSD compared to control conditions as a whole (Hedge's $g=1.08$). However, the authors found that compared to active controls, which Powers et al. deemed those which had components aimed at specifically addressing PTSD (e.g., CPT and eye movement desensitization and reprocessing), PE was not any more or less effective at reducing PTSD symptoms. Powers et al. reported medium to large effect sizes when comparing PE to psychological placebos (i.e., present-focused treatments) and to wait-list controls. Power et al. concluded that PE is an extremely efficacious individual treatment for PTSD.

Cognitive Processing Therapy (CPT) (Resick & Schnicke, 1992), the second most empirically supported treatment for PTSD as explicated in ISTSS's guidelines (Foa et al, 2009) and the second therapy to be widely disseminated by the VA (Karlin et al., 2010), has a much clearer cognitive component. It is typically a 12-session, manualized cognitive behavioral treatment. The theory (e. g., social cognitive theory) underlying this treatment is somewhat compatible with the theory upon which PE is based. However, in CPT, the purpose of affective exposure is to allow for emotions to be naturally processed and thus, to dissipate, rather than to be successfully habituated. Furthermore, congruent with the cognitive theories of PTSD, the primary focus of this treatment is to identify and challenge trauma-related cognitions pertaining to self-blame and negative appraisals of the self and the world (Resick & Schnicke, 1992). The content of these negative appraisals are also thought to typically fit into one of five themes discussed with the client—intimacy, trust, esteem, power/control, and safety. In addition, there is a small exposure component to this treatment. Specifically, clients are instructed to write about their trauma in detail, read it aloud in session, and then to rewrite and read their trauma account in session a second time. However, recent studies by the originators of this treatment have reported that CPT is equally as effective in treating PTSD without having clients complete the trauma account as it is including the exposure component (Resick et al., 2008).

Several studies (Alvarez et al., 2011; Monson et al., 2006; Owens et al., 2001; Resick, Nishith, Weaver, Astin & Feuer, 2002; Schulz, Resick, Hubert, & Griffin, 2006; Zappert & Westrum, 2008) have demonstrated the efficacy of using CPT to treat PTSD in a variety of populations, including veterans and civilian women in residential treatment

programs, traumatized refugees receiving CPT through an interpreter, outpatient veterans, and survivors of adult sexual assault and child sexual abuse. Some of these studies sought to explore the role in changes in cognition in CPT's successful reduction of PTSD symptoms. For example, Sobel, Resick, and Rabalais (2009) assessed individuals' decreases in assimilated and over-accommodated beliefs and increase in accommodated beliefs. Assimilation occurs when individuals alter information about the traumatic event in order to fit their existing schemas. Over-accommodation occurs when individuals change their pre-existing beliefs in an extreme fashion in order to incorporate the information gained from the trauma.

A primary goal of CPT is to help individuals develop accommodated beliefs in which they alter pre-existing beliefs in an adaptive and balanced way following a traumatic event (Resick & Schnicke, 1992). Sobel et al. reportedly evaluated the impact statements of 37 women who had been sexually assaulted both at the start and end of CPT. According to the researchers, the women demonstrated a decrease in over-accommodated and assimilated beliefs after completing CPT. Individuals also demonstrated an increase in accommodated beliefs. Furthermore, the authors reported that reductions in assimilation and over-accommodation were related to a decrease in PTSD symptoms from pre- to post-treatment, implicating changes in cognition as an important factor in the amelioration of PTSD.

In another outcome study on CPT, Owens et al. (2001) reported that in a sample of 53 female childhood sexual abuse survivors assigned to receive CPT from trained doctoral and masters level students, individuals demonstrated a significant reduction in cognitive distortions concerning safety, trust, power, esteem, and intimacy as well as in

PTSD symptoms. This determination was based on participants' responses to a clinical interview for PTSD and two questionnaires aimed at assessing cognitive distortions, which likely emerged following the traumatic event, as well as their beliefs about the traumatic event. Individuals completed this interview and questionnaires prior to beginning treatment, immediately following treatment, and at a 3-month and 1-year follow up. Owens et al. also reported that these reductions in cognitive distortions were maintained at both a 3-month and 1-year follow-up as indicated by participants' responses on the measures used in this study.

Because these negative beliefs were significantly correlated with PTSD severity at several points throughout the study, the authors suggest that a decrease in cognitive distortions lead to the decrease in PTSD symptom severity. However, this causal relationship cannot be definitively established, because the authors are drawing this conclusion from a pattern of significant correlations between individuals' PTSD symptoms and level of cognitive distortions at points pre- and post-treatment. Thus, it may be that a factor other than changes in cognitive distortions led to participants' significant reduction in PTSD symptoms and that the change in cognitive distortions is a consequence of this reduction. An additional study (Resick et al., 2002) evaluating the effectiveness of CPT in an individual format in treating female rape survivors reported that CPT resulted in a significant reduction in guilt cognitions in addition to overall PTSD symptomatology, with this reduction being maintained at a 9-month follow-up. Interestingly, this study was also conducted in order to compare the effectiveness of PE and CPT in treating PTSD. Resick et al. (2002) reported that both treatments were

successful in treating PTSD in rape survivors and that CPT was equally as effective as PE.

Another recent study sought to examine the effectiveness of CPT in a group format based on a sample of women veterans who had received treatment for PTSD at a VA between 1995 and 2013 (Castillo, Lacefield, C'de Bara, Blankenship, & Qualls, 2014). Castillo et al. reported that participants self-reported levels of PTSD significantly decreased after completing the group-CPT protocol; reporting a medium effect of treatment on self-reported level of PTSD.

However, a recent study suggests that PE may be more effective than CPT (Jeffreys et al., 2014). The authors reported that they utilized a retroactive chart review of 263 veterans receiving PTSD treatment to compare the impact of these two treatments on self-reported PTSD symptoms as measured by the PCL from pre- to post-treatment. The authors reported that PE yielded a significantly higher effect size from pre- to post-treatment ($d=2.0$) than did CPT ($d=.96$); although both yielded large effect sizes. Jeffreys et al. stated that this difference may be the result of the differing impact of the three types of CPT (i.e. individual, group, and individual plus group) that were examined together in this study on treatment outcome. According to the authors, CPT in an individual format was significantly more efficacious than either CPT in a group format or CPT in an individual plus group format.

The role of emotion regulation in PTSD. Although cognitive behavioral treatments have been viewed as front-line treatment for PTSD, recent research has indicated that emotion regulation may also be intimately connected to PTSD symptomatology, suggesting interventions targeting emotion regulation may also serve as

beneficial treatment for this disorder. Emotion regulation has been defined in a myriad of ways. However, Gratz and Roemer (2004) sought to develop a conceptualization that integrated the ideas of past researchers in this area. As a result, they described emotion regulation as that which involves the awareness and understanding of emotions, the acceptance of emotions, the ability to demonstrate impulse control and to act in a manner consistent with desired goals despite experiencing negative emotions, and the “ability to use situationally appropriate emotion regulation strategies flexibly to modulate emotional responses as desired in order to meet individuals goals and situational demands” (Gratz & Roemer, 2004, pp. 42-44).

Several studies have identified a link between emotion regulation and PTSD symptom severity. For example, Price, Monson, Callahan, and Rodriguez (2006) reported that improvement in emotion regulation as well as a reduction in fear of losing affective control was associated with a decrease in PTSD symptom severity. These results were gleaned from a sample of 81 male veterans taking part in a day-treatment program for PTSD at a VA medical center. Furthermore, the authors found that reductions in fear of losing affective control actually predicted changes in PTSD symptom severity from pre- to post-treatment. These findings were based on the evaluation of a CBT and psychoeducational program facilitated by a staff comprised of doctoral level psychologists and one master’s level psychologist, psychiatrist, substance abuse counselor, and chaplain.

Similarly, Ehring and Quack (2010) reported that PTSD symptoms were associated with emotion regulation difficulties. Ehring and Quack surveyed 616 individuals who had experienced a wide range of traumas, including childhood and adult

interpersonal trauma as well as non-interpersonal trauma. The average age of these individuals was 32 years old. A majority of the participants were women and were also single. The authors' report of association between PTSD symptoms and emotion regulation difficulties was established by correlating individuals' responses to measures of both PTSD symptomatology and emotion regulation. Ehring and Quack also noted that early onset interpersonal trauma had more emotional regulation difficulties than did a single event adult trauma. However, the authors did provide the caveat that differences in emotion regulation between these two groups were not as clear when controlling for PTSD symptom severity.

Frewen, Dozois, Neufeld, and Lunius (2012) also reported that women with PTSD had a greater difficulty identifying feelings and with emotion regulation than did women without PTSD. In their report, the authors stated that the results of this study suggest that individuals with PTSD experience a core disruption in emotional expression. Similar links were reported by Vujanovic, Bonn-Miller, Potter, Marshall-Berenz, & Zvolensky (2011) and Marshall-Berenz, Vujanovic, Bonn-Miller, Bernstein, and Zvolensky (2010). Vujanovic Bonn-Miller et al. found that distress tolerance—described as the ability to withstand negative emotions—was significantly negatively correlated with PTSD in a sample of 140 individuals who endorsed having experienced a traumatic event meeting Criterion A of the DSM-IV. Vujanovic, Bonn-Miller, et al. reported that the strongest association of distress tolerance and PTSD symptomatology was with the hyperarousal cluster of symptoms. Marshall-Berenz et al. (2010) provided even greater support for the link between distress tolerance and PTSD in their mix-gender sample of 81 adults who had reported experiencing a traumatic event that met Criterion A.

According to these authors, individuals' responses on measures of emotion regulation and PTSD symptoms indicated that the ability to withstand exposure to aversive emotional states predicted PTSD symptom severity in their sample.

Given that BPD and PTSD are highly comorbid and that individuals with BPD alone are thought to have difficulties with emotional regulation, Marshall-Berenz et al. (2011) explored the relationship between these two disorders and emotion regulation in a mixed-gender sample of individuals with BPD. According to the authors, PTSD symptom severity—*not* BPD—was significantly related to emotional dysregulation; specifically, affect intensity and affective lability. As a result, the authors suggested that it is important to combine more conventional PTSD treatments (i.e., CPT) with those aimed at improving emotion regulation.

The high comorbidity between PTSD and substance abuse has also been well documented (Ford & Fournier, 2007; Kessler et al., 1995; Ray, Primack, Chelminski, Young, & Zimmerman, 2011). This has led researchers to explore what factors contribute to this high comorbidity. In a study focused on PTSD and marijuana use, Potter, Vujanovic, Marshall-Berenz, Bernstein, and Bonn-Miller (2011) surveyed 142 individuals from Vermont who reported experiencing a traumatic event that met Criterion A of the DSM-IV for PTSD. 95.8% of the participants were white, they did not have a psychotic-spectrum mental illness, and their average age was 22. Potter et al. found that PTSD symptom levels were associated with both increased marijuana use levels and a decreased perceived ability to tolerate emotional distress. Based on their results, Potter et al. suggested that individuals were using marijuana as a means to cope with their intolerance of adverse emotional experiences. O'Hare and Sherrer (2011) made similar

conclusions in their study on drinking motives in individuals with comorbid PTSD and SMI. According to O'Hare and Sherrer, PTSD symptoms have a direct impact on the amount and with what frequency individuals with SMI drink because these individuals are drinking to cope with their negative emotions. Thus, the authors contend that there is a need for improved regulation skills in these individuals.

A recent study utilized fMRI technology to explore the relationship between PTSD and emotion regulation. Xiong et al. (2014) compared 20 participants with and without PTSD on their ability to regulate their emotions when viewing negative stimuli. The authors concluded from the brain activation patterns of participants that individuals diagnosed with PTSD were poorer at reducing negative emotional responses than were individuals without PTSD.

Treatments for PTSD that address emotion regulation. This link between PTSD and emotion-regulation has led many researchers to call for the integration of traditional PTSD treatments with those that improve emotion regulation. Mindfulness-based training is one such intervention thought to positively impact emotion regulation. Mindfulness has been described as “the state of being attentive to and aware of what is taking place in the present moment” (Warren Brown & Ryan, 2003, p. 822). Within this definition, awareness is thought of as the background process in which both internal and external stimuli are being monitored; although these stimuli may not be the center of attention. Attention occurs when the individual focuses on the stimuli in his or her awareness. Furthermore, these two processes are characterized by clarity, flexibility, continuity, being present, and empiricism (Warren Brown & Ryan, 2003; Warren Brown, Ryan, and Creswell, 2007). Mindfulness also requires one to engage in this awareness of

the present moment without evaluating it and without elaborating on any particular component of it (Chambers et al., 2009). Additionally, Warren Brown and Ryan argue that mindfulness differs from other cognitive functions because it operates on—not within—thoughts, feelings, and sensations.

Chambers et al.'s (2009) review points to several products of mindfulness that are likely beneficial for recovery in individuals suffering from PTSD. For example, the authors highlight that relaxation is often a side effect of mindfulness. They also report that individuals who practice mindfulness often develop metacognitive insight, which allows them to see thoughts as just thoughts, rather than a reflection of reality. Chambers et al. further explain that mindfulness is associated with a reduction in both rumination and overgeneralized autobiographical memories that lead to negative self-appraisals. Increased acceptance of one's experiences and exposure to negative emotions are also thought to be the result of mindfulness. Chambers' et al. (2009) emphasize that mindfulness promotes healthy engagement with emotions without experiential avoidance and rumination, which are important to emotion regulation. Adding to this, Feldman and Hayes (2006) explain that through mindfulness, one is able to develop a distanced relationship with his or her internal experiences and thus, is better able to decrease emotional reactivity and return to baseline after reactivity.

Research has demonstrated a connection between mindfulness and emotion regulation. Warren Brown and Ryan (2003) explored correlations between measures of mindfulness and well-being and found that mindfulness is associated with affect regulation (i.e., awareness, understanding, and acceptance of emotions) and the ability to repair one's emotions. These authors also reported that mindfulness is significantly

negatively correlated with impulsiveness, indicating that when mindful, individuals are able to act in a way consistent with their goals. Furthermore, Creswell, Way, Eisenberger, and Lieberman (2007) conducted an fMRI study which demonstrated that individuals who reported higher levels of mindfulness showed less emotional reactivity than did those individuals who reported lower levels of mindfulness. Studies evaluating the effects of mindfulness induction showed results consistent with that of Creswell et al. Moreover, individuals engaged in a mindfulness exercise demonstrated better emotion regulation as well as quicker recovery from negative affect (Arch & Craske, 2006; Broderick, 2005). Smith et al. (2011) explored the relationship between mindfulness and PTSD in a group of 124 firefighters from New Mexico. They reported that mindfulness was related to both fewer PTSD and depressive symptoms.

As a result of the connection between emotion regulation, mindfulness, and PTSD, Vujanovic, Niles, Pietrefesa, Schmertz, and Potter (2011) argue specifically for the use of mindfulness-based interventions in the treatment of PTSD, especially with the veteran population. They suggest that the use of such interventions will encourage individuals to approach negative emotions and thoughts rather than avoid them so that individuals will also increase their willingness to confront emotional triggers such as specific people, places, and situations. Furthermore, the authors argue that this will allow individuals to more effectively engage in treatment, and that the nonjudgmental stance encouraged in mindfulness may decrease secondary emotions such as shame and guilt. Lastly, the authors posit that the use of “mindfulness distraction” will help individuals to identify times when shifting attention away from disturbing images or feelings may be more helpful than to ruminate on them.

One study, which demonstrated the effectiveness of mindfulness and emotion regulation focused interventions in treating PTSD, was conducted by Kimbrough, Magyar, Langenberg, Chesney, and Berman (2010). In their study, Kimbrough et al. used Mindfulness-Based Stress Reduction (MBSR), which was thought to “increase clarity, attention, calmness, and emotional well-being (p. 19),” to treat PTSD in a sample of survivors of childhood abuse. Individuals with SMI, such as schizophrenia or BPD were excluded from this study. MBSR consisted of teaching participants sitting and guided meditation, a progressive body awareness meditation, contemplative walking, and gentle yoga stretching exercises. These components were taught at eight, 2.5-3 hour long classes. Individuals also attended a five-hour silent retreat as part of the program. The classes were facilitated by a MBSR trained teacher with over 10 years of experience. Kimbrough et al. found that individuals reported a significant decrease in PTSD symptoms following completion of this program and that this decrease in symptoms was maintained 24 weeks after the baseline assessment. The authors concluded that the intervention likely was successful because it helped participants to be present in their emotional experiences, rather than to avoid them.

Kearney, McDermott, Malte, Martinez, and Simpson (2012) also evaluated the effectiveness of a MBSR class on PTSD symptoms. Participants were 92 male and female veterans who had completed the program over a 17-month period. Kearney et al.’s protocol followed the same eight-session format as did Kimbrough et al (2010). Participants also completed a seven-hour mindfulness retreat as part of the program. Kearney et al. found that participants reported a significant decrease in PTSD symptoms from pre-treatment to both a 2-month and 6-month follow-up and improved levels of

depression and health-related quality of life. Furthermore, they reported that changes in mindfulness skills were significantly associated with changes in PTSD symptom severity. The researchers' mediational analysis also revealed that participants' increase in mindfulness skills mediated the relationship between participation in the program and changes in PTSD symptoms.

King et al. (2013) conducted a pilot study to examine the effectiveness of mindfulness-based cognitive therapy (MBCT) for the treatment of PTSD in veterans. Fifteen male veterans completed eight, eight-hour sessions of MBCT that involved mindfulness practice, psychoeducation on PTSD, and supportive group exercises. King et al. reported that individuals demonstrated significant reductions in PTSD symptoms as measured by both the Clinician Administered PTSD Scale (CAPS) and the PCL, providing strong initial support for the effectiveness of treatments aimed at promoting emotion regulation in treating PTSD.

Bryant et al. (2013) recognized the limitations of CBT to treat PTSD as well as the value of emotion regulation skills in this treatment. Bryant et al. randomized 70 adults to receive either supportive counseling followed by CBT for PTSD or to receive emotion regulation skills training followed by CBT. Exclusion criteria included a recent history of psychosis and BPD. Emotion regulation skills training involved identifying and labeling emotions, mindfulness practice, and distraction. Bryant et al. reported that patients who received emotion regulation skills training plus CBT demonstrated greater treatment adherence as well as greater reductions in PTSD symptoms than did those participants who had participated in supportive counseling plus CBT. Additionally, the authors reported that those who received emotion regulation skills training demonstrated higher

overall functioning at the end of treatment than did the comparison group. The use of randomization in this study provides strong support for the additive effect of interventions aimed at improving emotion regulation in the treatment of PTSD.

PTSD and Serious Mental Illness (SMI)

As indicated by the studies discussed above, much of the research on the treatment of PTSD as focused on non-SMI populations. In fact, many of the studies referenced exclude individuals with SMI from participation. The term “severe mental illness” is associated with a heterogeneous population of persons with disorders that cause significant impairments relative to psychological and social functioning, including aspects of interpersonal relations, personal care, leisure, and work (Mueser & McGurk, 2004; Mueser, Rosenberg, Jankowski, Hamblen & Descamps, 2004). Disorders which fall within this category often include schizophrenia-spectrum disorders, bipolar disorder, borderline personality disorder (BPD), and chronic major depression (American Psychiatric Association, 2013). SMI does not refer to a diagnosis, however, but rather takes into account the duration of psychiatric symptoms and how much the symptoms impair the functioning of the individual (Bachrach, 1988). While there is limited research on the treatment of PTSD in individuals with SMI, the need for the identification of efficacious treatments for this population is highlighted by the literature in this area that has consistently reported that the prevalence of PTSD in individuals with SMI is substantially higher than that of the general population (Cusack, Grubaugh, Knapp, & Frueh, 2006; Mauritz, Goossens, Draijer, & van Achterberg, 2013; Mueser et al., 1998) and that the co-occurrence of trauma, or PTSD, and SMI increases the severity of symptoms experienced by the individual, decreasing his or her quality of life and self-

esteem and increasing the individual's level of cognitive impairment and number of psychotic symptoms—all of which hinder treatment (Briere, Woo, McRae, Foltz, & Sitzman, 1997; Cusack, Frueh, & Brady, 2004; Mueser, Essock, Haines, Wolfe, & Xie, 2004). Mueser et al. (1998) reported that 98% of their sample of individuals with SMI had experienced a traumatic event, and 43% met criteria for PTSD. Likewise, a meta-analysis by Mauritz et al. (2013) found that the average prevalence rate of PTSD in an SMI sample was 30%. These findings have led subsequent research to examine the effects of trauma exposure on symptom severity in populations with specific disorders.

Bipolar disorder. One disorder research in this area has examined is bipolar disorder. Persons with bipolar disorder fall victim to trauma at alarmingly high rates. In one study, participants who met criteria for bipolar disorder were found to be 2.6 times more likely to have experienced physical or sexual assault than those who did not meet criteria for bipolar disorder (Naria et al., 2008). In the same study, 31.6% of participants with bipolar disorder also had a diagnosis of PTSD. The results of a recent study examining PTSD prevalence in adolescents with bipolar disorder provide an interesting comparison to the high rates of PTSD in adults with PTSD. This study found that only 3% of adolescents with bipolar disorder met criteria for PTSD, and that 14% had clinically significant symptoms (Strawn et al., 2010). The authors of this article suggested that the lower prevalence of PTSD in adolescents with bipolar disorder than in adults with the disorder may implicate bipolar disorder as a risk factor for developing PTSD later in life.

The diagnosis of PTSD in conjunction with bipolar disorder has been found to be associated with more significant social and family life impairments (Macguire,

McCusker, Meenagh, Mulholland, & Shannon, 2008). Researchers (Naria et. al., 2008) suggest that these interpersonal difficulties mediate the effect of trauma on the quality of life of individuals with bipolar disorder. More specifically, the negative impact of trauma on interpersonal difficulties may be what increases the severity of bipolar symptoms in this population. However, the authors are quick to acknowledge the bidirectional relationship of symptom severity and interpersonal relationships. Furthermore, Assion et al. (2009) reported that individuals with bipolar disorder and PTSD have a poorer clinical outcome than do individuals with bipolar disorder alone. Other studies (Leverich et al., 2002; Macguire et al., 2008), demonstrate that a PTSD diagnosis is not required for bipolar symptoms to be exacerbated by trauma. Trauma in individuals with bipolar disorder was found to be associated with an earlier onset of illness, which is associated with a poorer prognosis, faster cycling, an increase in the severity of mania, and an increased risk of suicide attempts (Leverich et. al, 2002). Trauma in this population is also related to lower health-related quality of life and higher levels of inter-episode depressive symptoms, more frequent hospital admissions, and greater interpersonal difficulties (Macguire et al., 2008).

Schizophrenia. While some studies on bipolar disorder acknowledge that symptom severity increases in those who experience trauma even without a PTSD diagnosis, other researchers (Mueser, Rosenberg, Goodman, & Trumbetta, 2002) view the role of PTSD as much more prominent in persons with schizophrenia, proposing that PTSD mediates the relationship between trauma and symptom severity in this population. This mediational relationship can be explained relative to the three symptom clusters of PTSD—avoidance of stimuli related to trauma, distress related to re-experiencing the

trauma, and overarousal. Interpersonal trauma, the most common type of trauma experienced by individuals with SMI, requires individuals in this population to avoid people in order to avoid stimuli related to their trauma, resulting in social isolation (Mueser et al., 2002). This is significant when considered in light of the finding that social isolation is related to symptom relapse and rehospitalization in individuals with schizophrenia (Harrison, Croudace, Mason, Glazebook, & Medley, 1996). Additionally, Mueser et al. (2002) identify the distress individuals experience due to re-experiencing the trauma as a chronic stressor. This further explains the role of PTSD in symptom severity, as chronic stressors also often result in symptom relapse (Butzlaff and Hooley, 1998). The third cluster of PTSD symptoms, overarousal, may also negatively impact the course of the individual's mental illness. Specifically, overarousal is associated with a poor prognosis in this population (Straube & Ohman, 1990).

Supporting this hypothesis, Lu et al. (2011) found that individuals with comorbid PTSD and schizophrenia reported more severe symptoms of schizophrenia and that a greater interference of these symptoms on household, fun and leisure, school work, and sexual activities. Other researchers (Fan et al., 2008; Newman, Turnbull, Berman, Rodrigues, & Serper, 2010) report that individuals with schizophrenia or schizoaffective disorder and PTSD had more positive symptoms, more cognitive impairments, and lower self-reported quality of life than did individuals without PTSD. Furthermore, a recent review of the literature on trauma and psychosis reported that in individuals with schizophrenia spectrum disorders, those who had experienced childhood abuse were found to have an increased number of hospitalizations, more severe depression, and increased levels of suicidality (Manning & Stickley, 2009). Additionally, this review

reported that over three-fourths of individuals with schizophrenia reported that their auditory hallucinations were related to their traumatic experiences.

Borderline personality disorder. The negative impact of PTSD on Borderline Personality Disorder (BPD) has also been well-documented. According to Pagura et al. (2010), individuals with comorbid BPD and PTSD have significantly lower mental and physical health-related quality of life and are more likely report a co-occurring mood or anxiety disorder. These individuals also reported more severe BPD symptoms did individuals with BPD alone and more severe PTSD symptoms than individuals with only a diagnosis of PTSD. Recent research has also provided evidence that individuals with comorbid BPD and PTSD have higher emotional reactivity when shown violent pictures than do individuals with BPD alone (Sauer, Arens, Stopsack, Spitzer, & Barnow, 2014). This is consistent with findings reported by Marshall-Berenz et. al (2011), which indicated that greater PTSD symptom severity in individuals with BPD was associated with greater emotion dysregulation.

Suicide risk. For the SMI population, suicide is a very real concern. Even more disconcerting is the research finding that a diagnosis of PTSD often increases the likelihood that an individual will attempt or complete suicide (Panagioti, Gooding, & Tarrrier, 2009). Panagioti et al.'s review of the literature demonstrated that individuals who have experienced combat trauma, childhood abuse or adult sexual assault, and other types of trauma (i.e., accidents or criminal assault) have an increased risk for suicide attempts, completion, and suicidal ideation. Furthermore, this review also revealed that individuals diagnosed with comorbid PTSD and schizophrenia or another psychotic disorder experience higher rates of suicidality than do those individuals without comorbid

PTSD. (Panagioti et al., 2009). This comorbidity can be lethal for individuals with BPD as well. Pagura et al. (2010) reported that individuals with comorbid BPD and PTSD were more likely to have had a suicide attempt than were individuals who had either BPD or PTSD alone.

Substance abuse. The effects of PTSD and trauma on individuals with SMI are not limited to what some researchers have considered direct effects. PTSD may have indirect effects on the individual's disorder, including the development of substance abuse as a means by which to cope. For example, in a study of individuals with SMI, those who had endured some type of abuse and who were experiencing PTSD symptoms had an increased risk for substance abuse and high risk behaviors, which as part of a bidirectional relationship between PTSD and substance abuse often worsened their PTSD symptomatology (O'Hare, Shen, & Sherrer, 2010). Additionally, Pagura et al. (2010) found that when comorbid, individuals with BPD and PTSD are more likely to have a substance abuse disorder than are individuals with only one of the two disorders. This comorbidity of PTSD and substance abuse is prevalent in both men and women alike. Kessler et al.'s (1995) National Comorbidity Survey found that 51.9% of men and 27.9% of women diagnosed with PTSD also were diagnosed with lifetime alcohol abuse or dependence. In a study of only women, 60% of individuals who had experienced trauma reported using more than one substance, while 94% of those who met criteria for PTSD reported using two or more substances (Ford & Fournier, 2007). Similarly, in a sample of only men, individuals with either a lifetime or current substance abuse disorder were significantly more likely to meet criteria for PTSD than were men who did not have a substance abuse disorder (Ray et al., 2011).

Adding to the literature highlighting the comorbidity of PTSD and substance abuse, Gil-Rivas, Prause, and Grella (2009) reported that 98.5% of individuals entering a residential treatment program for substance abuse had experienced a trauma. Furthermore, one third of those individuals reported experiencing at least one additional trauma over the 12-month period following their completion of the treatment program, suggesting that individuals who have experienced one trauma are likely to experience subsequent trauma. The authors also reported that individuals who had experienced a trauma during this follow-up period demonstrated an increased likelihood of abusing substances following completion of the program (Gill-Rivas et al., 2009). The authors did report, however, that a lifetime history of trauma or PTSD was not associated with this increased risk for substance abuse post-treatment. Complicating this picture, Khoury, Tang, Bradley, Cubells, and Ressler (2010) reported that among participants in an urban setting, substance use was shown to increase as the extent of childhood trauma that an individual had experienced increased. Additionally, the individuals who were alcohol, cocaine, or marijuana dependent had significantly higher levels of PTSD symptoms than those who were not. The results of these studies indicate that substance abuse both prior to and following trauma or the development of PTSD is common and should be carefully considered as part of the screening and treatment of PTSD.

Treatment Approaches for Comorbid SMI and PTSD

Cognition and PTSD in individuals with SMI. While the research on treatment for comorbid SMI and PTSD is somewhat limited, the role of cognitive appraisal in PTSD has been explored specifically in individuals with SMI. Jackson, Knott, Skeate, and Birchwood (2004) reported that individuals hospitalized after their first episode of

psychosis who appraised their hospitalizations as particularly stressful were significantly more likely to have PTSD and to have more intrusive memories about the hospitalization than did those individuals who appraised it as less stressful. These results were based on 35 individuals, 75% of whom were men, from the UK who had been interviewed approximately 18 months following their hospitalization. Also noteworthy is Jackson et al.'s finding that 31% of individuals met criteria for PTSD at the time of the interview, indicating that hospitalization is a traumatic experience for many individuals with SMI.

Similar findings were reported in a sample of 33 individuals, 23 of whom were men and 97% of whom reported having experienced at least one traumatic event, from an outpatient center in the Netherlands diagnosed with schizophrenia or schizoaffective disorder (Lommen & Restifo, 2009). Using the PTCI, Lommen & Restifo reported that individuals' responses on all three scales of the PTCI (i.e., negative beliefs about the self, world, and self-blame) as well as individuals' total scores on the PTCI were significantly associated with PTSD symptom severity. Ford and Fournier (2007) evaluated similar factors in a sample of 35 women with SMI. 48% of these individuals were African American and 63% had an annual income that was under \$10,000. Ford and Fournier reported that cognitions about the self in which the individual viewed herself as damaged and powerless—consistent with Foa & Kozak's (1986) argument that one's belief that he or she is incompetent is important in the development and maintenance of PTSD—were significantly associated with PTSD diagnosis.

Other studies (Chisholm, Freeman, & Cooke, 2006; Kilcommons and Morrison, 2005) further suggest a relationship among trauma, psychosis, and negative appraisals. For example, Kilcommons and Morrison explored this relationship in 32 individuals with

schizophrenia spectrum disorders receiving services at a community mental health center in England. The authors of this study reported that negative appraisals about one's self and the world, as measured by the PTCI, after a traumatic event were positively correlated with hallucinations, indicating that more negative beliefs about the self and the world were associated with more severe hallucinations. Negative beliefs about the world were also significantly associated with more severe PTSD symptoms in this sample (Kilcommons & Morrison, 2005). In their study of individuals who had recently had a psychotic episode but were in remission and receiving services at a community mental health center in London, Chisholm et al. (2006) reported that approximately 60% found their psychosis to be traumatic enough to meet criteria for PTSD. Furthermore, the authors reported that PTSD symptoms following a psychotic episode were associated with self-blame appraisals, beliefs pertaining to helplessness, and an increased perception of threat relative to their delusions.

Cognitive treatments for PTSD in individuals with SMI. Cognitive behavioral treatments, including exposure, also have been utilized in individuals experiencing comorbid PTSD and SMI. CBT approaches focused on cognitive restructuring in order to alter core beliefs related to trauma currently appear to have the most support for treating PTSD in individuals with SMI. For example, Mueser et al. (2007) reported that after a 21-week CBT group, participants with SMI experienced an improvement in PTSD symptoms and trauma-related cognitions and that these improvements were maintained at a 3-month follow-up. This group therapy consisted of introductory sessions during which participants were taught breathing retraining and were provided psychoeducation on PTSD. The bulk of the program focused on teaching individuals cognitive restructuring,

in which they learned to evaluate the validity of their trauma-related beliefs and to generate, new more adaptive beliefs. This program also included components of coping skills and developing a recovery plan.

A later study indicated similar positive results of CBT on PTSD (Mueser et al., 2008). This program followed a 12-16 week individual therapy protocol, was implemented by six doctoral clinicians and one master's level clinician, and also included components of psychoeducation breathing retraining, and cognitive restructuring. Mueser et al. (2008) reported that the completion of a CBT group therapy program was associated with having a positive impact on both trauma-related beliefs and a reduction in PTSD symptoms. Further analysis revealed that CBT had a direct effect on trauma-related beliefs that allowed for PTSD symptom relief. Following treatment, 63%-73% of the CBT group still met criteria for PTSD, while in the treatment as usual (TAU) group, 77%-85% of individuals still met criteria for PTSD. Participants in the CBT group also reported a greater improvement in their therapeutic alliance than the TAU group, which the authors argue was result of a decrease in interpersonal distrust in the individuals, a prominent symptom of PTSD (Mueser et al, 2008). A replication study (Lu & Fite, 2009) with an ethnically diverse population of individuals with SMI reported similar results. According to Lu and Fite, a program similar to that described above resulted in a significant decrease in PTSD symptoms from pre- to post-treatment. Furthermore, Lu and Fite reported that this decrease in PTSD symptoms was maintained at a six-month follow-up.

Other researchers reported similar success when using exposure-based CBT with individuals with SMI (Frueh et al., 2009). These researchers utilized a manual-based

treatment program specialized for treating PTSD in individuals with SMI, which consisted of psychoeducation, anxiety management, social skills and anger management training, teaching on how to cope with trauma, and exposure therapy with homework. The results of this study indicated that upon completion of the program, individuals showed a significant reduction in PTSD symptoms. These symptom reductions were also maintained three months after individuals completed the program.

de Bont, van Minnen, and Ad de Jongh (2013) recently completed a pilot study examining the effects of PE and eye movement desensitization and reprocessing (EMDR) on individuals with psychosis. While controversy exists around EMDR concerning its mechanism of change, EMDR has substantial research supporting its efficacy in treating PTSD (Foa et al., 2009). EMDR contains components of cognitive restructuring and exposure with the inclusion of some type of alternating stimulation (e.g., saccadic eye movements) to aid in the neuronal reprocessing of traumatic memories (Nowill, 2010). van Bont, van Minnen et al. (2013) reported that 10 Dutch individuals, diagnosed with either schizophrenia or psychotic disorder NOS completed either PE or EMDR (five in each group). They reported that participant's change in self-reported levels of PTSD symptoms yielded a large effect and that EMDR and PE appeared to be comparable in their ability to treat PTSD in this sample. de Bont, van den Berg et al. (2013) described their plans for a study that will include a large sample of individuals with comorbid psychotic disorders and PTSD. The authors report that participants will be randomized to EMDR, PE, or the wait list group, and purport that the results of their study will provide strong evidence for the efficacy of PE and EMDR for individuals diagnosed with psychosis.

The studies described above underscore the importance of cognition and changing maladaptive trauma-related beliefs in treating PTSD in a variety of populations, including individuals with SMI. Research on both exposure and cognitive treatments for PTSD—both of which have been found to reduce negative trauma-related beliefs—has explored combining components of each treatment in order to determine if it would increase the efficacy of each treatment. However, research has indicated that cognitive restructuring does not necessarily enhance exposure techniques and that exposure techniques do not necessarily enhance treatments aimed at directly addressing the cognitions of individuals with PTSD. While the research does appear to indicate that trauma-related cognitions have an integral role in the development and maintenance of PTSD and that these beliefs may need to be altered in order to increase the likelihood that PTSD symptoms will subside, it also suggests that cognitions do not need to be directly addressed in treatment for them to be changed.

Emotional regulation treatments for borderline personality disorder. Given that the role of emotion regulation in PTSD has only recently been explored, it is not surprising that there is very limited research on this topic in individuals with SMI. Some research does exist that has focused on emotion regulation and recovery from PTSD in individuals with borderline personality disorder. Steil, Dyer, Priebe, Kleindienst, and Bohus (2011) used a Dialectical Behavior Therapy program with adult survivors of childhood sexual abuse to explore the impact of mindfulness-based interventions on PTSD. DBT is a cognitive behavioral treatment that maintains a dialectical approach wherein it is thought that the push for change can only happen within the context of acceptance and validation. (Rizvi, Steffel, & Carson-Wong, 2013). DBT was originally

designed for the treatment of BPD; particularly the emotion regulation difficulties that are thought to be at the core of this disorder. The format of DBT includes both individual therapy and group skills training. A central focus of the group skills training is mindfulness, which is the first module taught within the group that is also woven throughout the other modules of skills taught in the group—interpersonal effectiveness, emotion regulation, and distress tolerance (Rizvi et al., 2013).

The program examined in Steil et al.'s (2011) study was part of a residential program for 25 women identified as having treatment-resistant PTSD. Inclusion criteria included that the individual must have experienced childhood sexual abuse and must also have a diagnosis of an eating disorder, substance abuse, or BPD. Individuals received two weekly individual therapy sessions with a clinical psychologist and also attended group sessions focusing on skill building, mindfulness, self-esteem, and PTSD psychoeducation. The mean length of treatment for this sample was 82 days. According to the authors, the goal of the program was to target PTSD symptoms related to emotion dysregulation (i.e., avoidance of trauma triggers) as a means to reduce individuals' fear of primary emotions and to challenge thoughts which engender secondary emotions (e.g. shame and guilt). According to Steil et al., following completion of a DBT program, individuals exhibited significant reductions in PTSD symptom severity as well as in depression. These results were maintained at a six-month follow-up.

Harned, Korslund, and Linehan (2014) recently conducted a pilot, randomized controlled study for individuals with comorbid PTSD and BPD (participants with bipolar disorder or schizophrenia were excluded). In this study, 26 females were assigned to receive either one year of standard DBT or one year of DBT-PE. DBT-PE involved

individuals participating in the standard DBT program while completing a course of PE. The authors reported that both groups demonstrated large effect sizes on decreases in PTSD symptoms; however, they stated that the DBT-PE group had significantly greater improvements over time. This study demonstrates the benefits of utilizing treatments focused on emotion regulation in treating PTSD both alone and in conjunction with more typical cognitive treatments for PTSD.

While it is true that cognitive theories and subsequent treatments thought to impact cognition have dominated the research on and treatment of PTSD in the last few decades and that these treatments have been evaluated specifically with individuals with SMI, recent literature has emerged implicating emotion regulation as an important factor in the development and treatment of PTSD. However, research is lacking on the efficacy of treatments aimed at promoting emotion regulation in individuals with comorbid PTSD and SMI, suggesting this is an area requiring further exploration. It may be that treatment which impacts emotion regulation is also a viable treatment option for this population. Due to the relatively limited number of PTSD treatments that have been evaluated for use with individuals with SMI, it is especially important to identify other treatments programs as well as mechanisms through which these treatments work for individuals with comorbid SMI and PTSD.

Wellness management and recovery (WMR). Recent research has begun to identify new treatment programs for the SMI population that may aid in the amelioration of PTSD symptoms and that may help to meet the need for increased treatment options for this population. Specifically, Lee (2011) reported that Wellness Management and Recovery (WMR) has been associated with PTSD symptom reduction in individuals with

SMI.WMR is a psychoeducational program aimed at promoting mental health recovery in individuals with serious and persistent mental illness (Bullock et al., 2009).

A brief discussion of mental health recovery is warranted prior to an in depth look at how WMR seeks to promote recovery. As stated by many personal accounts of recovery as well as research focused on exploring the definition of “recovery” (Darke & Whitely, 2014), mental health recovery is a deeply personal journey, without an endpoint, that is unique to the individual experiencing it. Young and Ensing (1999) expanded on this understanding of recovery by drawing from the knowledge and experience of individuals living with SMI and who were on their own journey of mental health recovery. Young and Ensing’s qualitative study identified several key components of recovery as described by their participants. First, participants shared that recovery involves “overcoming stuckness,” which calls for one to acknowledge and accept his or her illness, to have the desire and motivation to change, and to find hope and inspiration to do change. Furthermore, participants explained that recovery includes processes of discovering and fostering self-empowerment, which require an individual to take responsibility for his or her own recovery and behavior. Participants also described recovery as a process of learning and self-redefinition during which individuals learn about themselves as well as learn to live in the moment. Other aspects of recovery discussed include returning to basic functioning, working toward attaining an overall sense of well-being, and striving for new potentials. (Young & Ensing, 1999).

The pathways through which WMR attempts to promote recovery are many. For example, WMR seeks to increase the self-efficacy of its participants by teaching them to “identify and achieve personal recovery and wellness goals,” “develop informed,

collaborative approaches with mental health providers to effectively select and manage their treatment and recovery,” and “achieve an overall healthier lifestyle” (Bullock et al., 2009). Furthermore, the focus of WMR is one of holistic wellness, involving physical, emotional, and spiritual health, rather than illness. The WMR program was developed by the Wellness Management and Recovery Coordinating Center of Excellence (WMR CCOE), a training and technical assistance center created and supported by the Ohio Department of Mental Health. The WMR CCOE works to aid in the implementation of evidenced-based clinical best practices in mental health recovery within Ohio’s public mental health system.

Two recovery-focused programs, the Ohio Medication and Algorithm Project consumer education program and the Illness Management and Recovery program disseminated by the New Hampshire-Dartmouth national EBP project supported by SAMSHA, were adapted to create the current WMR curriculum. (Bullock, O’Rourke, & Smith, 2005; Mueser et al., 2006). The WMR curriculum consists of ten sessions which occur once per week over ten weeks. Each session last for two hours and is co-facilitated by a staff member of the agency and a peer specialist who also receives mental health services. Both agency staff members and peer facilitators receive 24 hours of training focused on the WMR curriculum and the experiential learning of group facilitation techniques. Peer facilitators are a unique and salient aspect of WMR, as it recognizes the central role which peer support has in the recovery process of this population (Mowbray, Moxely, Jasper, & Howell, 1997).

Each of the ten sessions of WMR addresses a particular theme relevant to mental health recovery. The first session is entitled “Mental Health Recovery” and consists of

discussion on recovery and setting goals. “Wellness,” the topic discussed in session two, involves topics such as exercise and healthy eating. In session three, “An Understanding of Mental Health,” the group addresses a variety of topics including symptomatology, stigma associated with psychological disorders, and the effects of substances on mental health. Session four, “The Role of Medication,” consists of discussion on the individuals’ beliefs and feelings about medication in conjunction with the importance of medication adherence. “Learning to Manage Symptoms and Side Effects,” the fifth session, focuses on identifying and managing symptoms, as well as dealing with the side effects which occur as a result of taking medications. The sixth session, entitled “Effective Communication,” educates individuals about assertive communication, feedback, and sources of bias. Session seven, “Communication with Providers,” focuses on developing skills in the individuals which will better equip them to communicate with their doctors, mental health providers, nurses, and case managers. “Coordinating your Care” is the title of the eighth session, which aims to engender skills in the group members which will allow them to take a more active role in their treatment plan. The ninth session, “Building Social Support and Involving Others,” addresses the importance of social support and provides education on ways to meet and build relationships with others. The final session of WMR, “Planning for Wellness,” focuses on things such as identifying triggers and making plans during crisis, so individuals can successfully maintain their wellness during times of difficulty (Bullock et al., 2009; Wellness Management and Recovery: An Ohio Coordinating Center of Excellence; website: <http://wmrohio.org>, 2012)

The efficacy of WMR in promoting recovery within its participants has been, and continues to be, evaluated by an ongoing open clinical trial conducted by Bullock et al.

(2009). Data for this study is collected prior to participants' involvement in WMR, immediately following participants' involvement in WMR, and six months following participants' involvement in WMR. Three, primary measures are used to evaluate the efficacy of the WMR program—the WMR Client Self-Rating, the Mental Health Recovery Measure, and the WMR Social Support Questionnaire. The WMR Client Self-Rating Scale is a content-focused measure aimed at measuring an individual's increase in knowledge, ability to cope with symptoms, use of a wellness plan, and progress toward personal goals. It was adapted and expanded from the Illness Management and Recovery Client Self-Rating Scale (Salyers, Godfrey, Mueser, & Labriola, 2007) and through the addition of recovery-focused items in order to better align with WMR's recovery model. The WMR Social Support Questionnaire measures both the individual's quantity and quality of social support. The Mental Health Recovery Measure (Young & Bullock, 2003) a consumer-driven measure aimed at assessing an individual's overall well-being, rather than simply the presence or absence of symptoms, was developed in consideration of consumers' perspectives of what recovery looks like (Bullock et al., 2009).

Bullock et al. (2009) reported that following participation in the WMR program, individuals reported significant gains in recovery, the use of recovery strategies, and perceived personal progress toward recovery goals. These findings hold even 6 months after the completion of the program. More specifically, analysis of the WMR Client Self-Rating revealed that following participation in the WMR program individuals have more knowledge concerning their symptoms, treatment, coping strategies, and medications and are better able to use a wellness plan to prevent relapse. Individuals are also progressing toward personal goals, making healthy life-style choices, coping better with their

illnesses on a day-to-day basis, increasing their involvement in self-help activities, integrating the recovery philosophy into their lives, and involving their family friends in their mental health treatment (Bullock et al., 2009). Additionally, analysis of the WMR Social Support questionnaire reveals that individuals increase the number of persons in their social support circle following participation in WMR and that these individuals are more satisfied with the support they receive from their social support group following participation in WMR.

Individual changes on the Mental Health Recovery Measure were also examined, determining the proportion of individuals whose scores indicate they have reliably improved or reliably deteriorated ($p < .05$) following participation in WMR and the proportion of individuals who have demonstrated meaningful improvement or meaningful deterioration following participation in WMR ($p < .20$). Results indicate 4% of individuals showed meaningful deterioration and 5.9% showed reliable deterioration following participation in WMR. The percentage of individuals showing improvement is much greater, as 11.3% of individuals showed meaningful improvement and 27.7% of individuals showed reliable improvement following participation in WMR. Just over fifty-one percent of participants showed no significant change. The results are noteworthy considering the “Rule of Thirds,” which suggests that without treatment, one-third of individuals with a mental illness show improvement, one-third of individuals show deterioration, and one-third of individuals show neither improvement nor deterioration. Clearly, WMR is proving more efficacious than no treatment, as more than one-third of individuals showed improvement following participation in WMR and less than one-third

of individuals showed deterioration following participation in WMR (Bullock et al., 2009).

Qualitative data has been collected in addition to the quantitative data collected on individuals who have participated in WMR. The results of the thematic analysis of participants' feedback about participating in the WMR program revealed that before participating in WMR, individuals felt fearful, isolated, doubtful, inhibited, and stuck in their situations. Conversely, following participation in WMR, individuals expressed feelings of growth, learning, renewed energy, socialization, and an ability to overcome prejudice and stigma. Additionally, individuals shared that participating in WMR helped them to feel empowered and hopeful, to recognize their self-worth, and to see themselves as advocates for persons with mental illness. Furthermore, individuals shared that WMR benefited them by providing role models for recovery, helping them to see they were not the only ones coping with mental illness, and providing the opportunity to help others (Bullock et al., 2009).

Most pertinent to the current discussion is the finding that following participation in WMR, individuals' self-reported levels of PTSD symptoms decreased significantly (Lee, 2011). Consistent with other previous research conducted with individuals with SMI, Lee reported that prior to beginning the WMR program 48.5% of individuals met criteria for PTSD, as measured by the Posttraumatic Stress Disorder Checklist (PCL; Weathers, Huska, & Keane, 1991). However, following participation in WMR, only 27% of individuals met criteria for this. Furthermore, it was reported that 48% of the individuals also demonstrated a reliable improvement in their PTSD symptoms based on their reduction in scores on the PCL. Although not a trauma-focused treatment developed

for PTSD in individuals with SMI (Frueh et al., 2009; Mueser et al., 2007; Mueser et al., 2008; Lu & Fite, 2009) WMR has been demonstrated to be associated with a significant reduction in PTSD symptom levels following participation in the program. This suggests that programs aimed at promoting recovery in individuals with SMI—not only cognitive and/or exposure-based therapies—may have a role to play in providing effective trauma treatment. This supposition is further supported by the results of Sloan, Feinstein, Gallagher, Beck, and Keane’s (2013) meta-analysis examining outcomes for group treatments for PTSD; including both cognitive-behavioral trauma-focused treatments and present-focused treatments. Results of this meta-analysis reported that to date, no group treatment for PTSD has been identified as superior to other group treatments. Still, the mechanisms through which WMR may promote trauma recovery remain unclear. Thus, further research is warranted with respect to WMR specifically, and is necessary to continue to expand the avenues of PTSD treatment in individuals with SMI. This expansion is especially important considering the negative impact PTSD has on the SMI population, the lack of research exploring treatment of PTSD for individuals with SMI, and the lack of treatment options for individuals with comorbid PTSD and SMI.

Chapter 3

Statement of the Problem

To date, research has primarily sought to determine the efficacy of cognitive and exposure therapies for the treatment of PTSD in individuals with SMI (Frueh et al., 2009; Lu & Fite, 2009; Mueser et al., 2007; Mueser et al., 2008). Furthermore, available research also contends that trauma-related cognitions have the greatest importance in the development and maintenance of PTSD in these individuals (Sherrer, 2011). However, changes in emotion regulation may be an additional pathway through which individuals with SMI can achieve PTSD symptom relief, as recent research has identified emotion regulation as an important factor in the development and maintenance of PTSD (Ehring & Quack, 2010; Frewen et al., 2012; Price et al., 2006). Additionally, treatments that enhance emotion regulation skills have been demonstrated to be associated with significant reductions in PTSD symptoms in individuals without SMI (Kimbrough et al., 2010; Steil et al., 2011). However, research is lacking concerning the role of emotion regulation in the reduction of PTSD symptoms in individuals with SMI.

WMR, a recovery-focused, psychoeducational program, which markedly differs from cognitive and exposure-based treatments for PTSD, has also been demonstrated to be associated with a significant reduction in PTSD symptom levels following participation in the program (Lee, 2011). However, it remains unclear what impact WMR has on trauma-related cognitions or emotion regulation skills and how this may be related to PTSD symptom relief in individuals with SMI. Some components of WMR may promote changes in participants' negative beliefs about themselves or the world; specifically, WMR strongly emphasizes the concepts of empowerment, self-direction,

reducing self-stigma, advocacy, social support, assertive communication, and hope, which may improve one's perception of themselves and the world by demonstrating their ability to cope with their illnesses while pursuing meaningful life goals and increasing their ability to develop trusting relationships with individuals both inside and outside of the WMR group. Supporting this premise is research that has demonstrated that even treatments that do not explicitly discuss beliefs individuals have pertaining to a traumatic event can still reduce his or her negative trauma-related beliefs (Foa & Rauch, 2004; Moser et al., 2010). As Hageaars et al. (2010) concluded in their study on the effects of PE on trauma-related cognitions, exposure to new information that is contrary with one's trauma-related beliefs may be enough to change his or her belief system. Thus, WMR may have an underlying exposure component that will promote the restructuring of participants' trauma-related beliefs. For example, a large portion of the items on the PTCI assess trauma-related cognitions about one's self. Research (Bullock et al., 2009) has demonstrated that following participation in WMR, participants feel empowered and begin to view themselves as more capable of navigating the world. Participants' view of themselves as being empowered individuals is likely incompatible with beliefs like "I am damaged" and "I am incapable," which are common in individuals with PTSD, and may result in them no longer holding such beliefs. Additionally, the sharing of someone else's recovery from a traumatic event may also be a type of exposure that encourages WMR participants to change their trauma-related beliefs (e.g., "I am alone" or "I should be ashamed to tell my story").

WMR may also be contributing to participants' reduction in PTSD symptomatology by enhancing their emotion regulation skills. This is supported by

outcome research that has demonstrated that individuals report an increase in coping strategies following participation in WMR which may include ways to cope with negative emotions. Such coping strategies may include relaxation techniques, effectively communicating with one's treatment team to improve treatment outcomes, the use of "I" statements to effectively communicate one's feelings and needs as means to maintain and improve relationships, and coping strategies focused on holistic wellness (e.g., improving sleep, nutrition, and frequency of exercise). Bullock et al. (2009) also reported that WMR increases individuals' social support networks. This is important considering findings that have found that seeking social support is one way in which individuals regulate negative affect (Parkinson & Totterdell, 1999).

Furthermore, the positive impact of WMR has been described as coming as much from the *process of doing* WMR and the *core values* that are promoted by this process (e.g., holistic health, strengths-based, peer support, and recovery centric) as much as the content of the material provided in the WMR manual (Wellness Management and Recovery Coordinating Center of Excellence; website: <http://wmrohio.org>, 2012). While there are not outcome studies which directly support this hypothesis, it is likely that it is the engagement in the *process* of WMR that promotes mindfulness skills such as being aware of and attending to one's current state of being. For example, Young & Ensing's (1999) research on recovery from peers' perspectives, identified "living in the moment" as one key aspect of recovery. This is significant considering research which has demonstrated an association between mindfulness skills and one's ability to regulate his or her emotions (Creswell et al., 2007; Warren Brown & Ryan, 2003). Thus, like other

evidence-based practices (i.e., Motivational Interviewing and DBT), the resources gained by participants are not solely a result of the content of the treatment's curriculum.

WMR was developed for a particular group of individuals struggling with a unique set of challenges as a result of living with SMI, and the impact of the *process* of WMR on those individuals cannot be overemphasized. Outcome research (Bullock et al., 2009) on WMR has clearly demonstrated that its effect on participants' functioning and recovery far extends changes that are strictly cognitive in nature. As a holistic treatment for this special population that impacts body, mind, and spirit, it would seem likely that WMR's effect on participants' emotion regulation skills (e.g., being able continue working toward one's goals despite the presence of strong emotions and the ability to not criticize one's self for feeling strong emotions), which likely greatly influence their behavior and self-concept, would have a stronger relationship with their reduction in PTSD symptoms than would changes in cognition.

Treatment options for individuals with comorbid PTSD and SMI are limited, which likely contributes to the lack of treatment of PTSD in this population, despite its association with more severe symptoms in these individuals. This suggests the need for research to more closely evaluate the treatment programs and associated factors which are most pivotal in the amelioration of PTSD in individuals with SMI. Providing clinicians with more knowledge on these programs and factors will better enable them develop a treatment plan for individuals with comorbid PTSD and SMI.

Purpose of the Study

The purpose of the present study was to expand on previous research exploring the role of both cognitive appraisal and emotion regulation in the reduction of PTSD in

individuals with SMI as well as to replicate and extend research that has found that participation in WMR is associated with a significant reduction in PTSD symptoms. More specifically, this study sought to determine whether or not cognitive appraisal or emotion regulation plays a more integral role in the reduction of PTSD symptoms in participants with SMI following participation in WMR. The current study was designed to augment the literature on the development and maintenance of PTSD in individuals with SMI; particularly with the unique population of individuals who choose to participate and complete the WMR program.

Research Questions

Given the purpose of the present study to determine the role of individuals' trauma-related cognitions and emotion regulation skills in the maintenance of PTSD in individuals with SMI who are participating in WMR, the following questions were of interest: 1) What is the relationship between individuals' trauma-related cognitions and their self-reported level of PTSD symptoms prior to beginning WMR? 2) What is the relationship between individuals' self-reported emotion regulation skills and their self-reported level of PTSD symptoms prior to beginning WMR? 3) Do participants' self-reported level of PTSD symptom severity significantly decrease from pre- to post-WMR? 4) Do participants' self-reported level of negative, trauma-related cognitions decrease from pre- to post-WMR? 5) Do participants' self-reported level of emotion regulation difficulties decrease from pre- to post-WMR? 6) What is the relationship between individuals' changes in trauma related cognitions and their self-reported change in level of PTSD symptoms from pre- to post-WMR? 7) What is the relationship between individuals' changes in self-reported emotion regulation skills and their changes in self-

reported level of PTSD symptoms from pre- to post-WMR? 8) Are participants' self-reported changes in trauma-related cognitions, or changes in emotion regulation skills, a better predictor of participants' changes in self-reported levels of PTSD symptoms from pre- to post-WMR?

Hypotheses

Based on previous research demonstrating that both trauma-related cognitions and emotion regulation are related to the development and maintenance of PTSD, that treatments aimed at addressing both of these factors have been demonstrated to reduce PTSD symptom severity, and that individuals who complete the WMR program report a significant reduction in PTSD symptoms from pre- to post-WMR, the following hypotheses were investigated:

1. Individuals' self-reported levels of negative trauma-related cognitions would be significantly, positively correlated with their self-reported levels of PTSD symptom severity prior to participating in WMR.
2. Individuals' self-reported levels of emotion regulation difficulties would be significantly, positively correlated with their self-reported levels of PTSD symptom severity prior to participating in WMR.
3. Individuals' self-reported levels of PTSD symptom severity would significantly decrease from pre- to post-WMR.
4. Individuals' self-reported levels of negative trauma-related cognitions would significantly decrease from pre- to post-WMR.
5. Individuals' self-reported levels of emotion regulation difficulties would significantly decrease from pre- to post-WMR.

6. Changes in self-reported levels of negative trauma-related cognitions from pre- to post-WMR would be significantly, positively correlated with changes in self-reported levels of PTSD symptom severity from pre- to post-WMR.
7. Changes in self-reported levels of emotion regulation skills from pre- to post-WMR would be significantly, positively correlated with changes in self-reported levels of PTSD symptom severity from pre- to post-WMR.
8. Changes in self-reported levels of emotion regulation skills from pre- to post-WMR would better predict changes in self-reported levels of PTSD symptom severity from pre- to post-WMR than changes in self-reported levels of negative trauma-related cognitions from pre- to post-WMR.

Chapter Four

Method

Participants

Participants were 86 individuals living with SMI and currently receiving psychiatric and support services at four community mental health centers, one state psychiatric hospital and one consumer operated site. Sites were located in central and northern Ohio and all sites were implementing the WMR program as part of their continuum of services. Each participant was completing the WMR program for the first time. Although specific individual diagnoses were unavailable, typical psychiatric diagnoses for this community sample included bipolar disorder, schizophrenia, and schizo-affective disorder, often with co-occurring substance abuse disorders. Furthermore, all individuals exhibited significant functional impairment, indicated by their need for public mental health services, which is central to SMI (Bachrach, 1988). Participants were at least 18 years old, participated voluntarily, and were legally competent to sign an informed consent to participate in the research project or had a legal guardian sign if required (See Appendix A). Referrals to the WMR program most often come from individuals' case managers or therapists.

Demographic data pertaining to sex, age, level of education, ethnicity, marital status, living situation, and employment status is presented in Table 1. The average age for this sample was 45.08 years old (SD=11.80; Range=19-68). Of the total sample, 48.8% of participants identified as male, and 51.2% identified as female. Relative to highest level of education completed, 3.5% of individuals reported that they had earned a graduate degree, 5.8% reported having received education at a trade or technical school,

10.5% reported that they earned a four-year, undergraduate degree, 11.6% reported earning an associate's degree, 17.4% indicated that they had graduated from high school or earned a GED, 19.8% reported that they had completed no higher than eleventh grade, and 31.4% reported having had some college education. Ethnicity data showed that 1.2% of participants identified as Native American/Pacific Islander, 2.3 % identified as Hispanic/Latino, 9.3% identified as some other ethnicity, 24.4% identified as Black/African American, and 62.8% identified as White/Caucasian. Of the total sample, 3.5% reported that they were living with a partner at the time of data collection, 4.7% reported that they were widowed, 7.0% reported that they were currently married, 14.0% reported they were separated, 30.2% reportedly were divorced, and 40.7% reported that they had never been married. Participants also reported their current living situation. Specifically, 1.2% reported their living situation as "other," 4.7% reported living in a group home, 4.7% reported that they were homeless, 6.9% reported living in a state mental health hospital, 7.0% identified as living in supervised group living or apartment, 19.8% reported living in a friend's or relative's home, and 55.8% reported living in their own home or apartment. Employment status was also requested. Responses indicated that 1.2% of participants identified as an inmate of an institution, 1.2% identified as a homemaker, 1.2% identified as being employed full time, 2.3% identified as being a student, 2.3% identified as being retired, 8.1% identified as being employed part-time, 39.5% identified as being unemployed, and 44.2% identified as being disabled.

Table 1
Demographics for N=86

Variable	% or Mean
Sex	
Male	48.8%
Female	51.2%
Level of Education	
K-11	19.8%
High School/GED	17.4%
Trade/Tech School	5.8%
Two-year College/Associate's	11.5%
Some College	31.4%
Four-year College Degree	10.5%
Graduate Degree	3.5%
Ethnicity	
Native American/Pacific Islander	1.2%
Hispanic/Latino	2.3%
Other	9.3%
Black/African American	24.4%
White/Caucasian	62.8%
Marital Status	
Living with partner	3.5%
Widowed	4.7%
Married	7.0%
Separated	14.0%
Divorced	20.2%
Never Been Married	40.7%
Living Situation	
Other	1.2%
Group Home	4.7%
Homeless	4.7%
State Mental Health Hospital	7.0%
Supervised Group Home or Apartment	7.0%
Friend/Relative's Home	19.8%
Own Home/Apartment	55.8%
Employment Status	
Employed Full-time	1.2%
Inmate of Institution	1.2%
Homemaker	1.2%
Retired	2.3%
Student	2.3%
Employed Part-time	8.1%
Unemployed	39.5%
Disabled	44.2%

Measures

Posttraumatic stress disorder checklist. The Posttraumatic Stress Disorder Checklist (PCL) (Weathers et al., 1991), a 17-item self-report measure aimed at assessing PTSD symptoms, was used to measure PTSD symptom levels in participants at pre- and post-treatment (See Appendix B). Each of the 17 items are rated by the individual indicating to what degree he or she has been bothered by a symptom in the past month, using a 1 to 5 scale in which 1 indicates “not at all” and 5 indicates “extremely.” An example of an item on the PCL is: “Repeated disturbing memories, thoughts, or images of the (stressful experience).” Scores may range from 17 to 85, with higher scores indicating higher levels of PTSD symptomatology. The initial psychometric data, presented by Weathers, Litz, Herman, Huska, & Keane (1993), utilized 1006 veterans who served in the Persian Gulf. Weather’s et al. reported that the mean score for veterans with and without PTSD was 64.2 ($SD=9.1$) and 29.4 ($SD=11.5$), respectively. The authors also reported that the PCL has good test-retest reliability ($r=.96$) and high internal consistency among B ($\alpha=.93$), C ($\alpha=.92$), and D ($\alpha=.92$) PTSD symptom clusters and all 17 symptoms ($\alpha=.97$). Weather’s et al. stated that the PCL demonstrates adequate convergent validity, demonstrated by its positive correlations with the Mississippi PTSD Scale ($r=.85$ and $r=.93$). PTSD symptom clusters and all 17 symptoms ($\alpha=.97$).

More recently, Grubaugh, Elhai, Cusack, Wells, and Frueh (2007) explored the use of the PCL with individuals with SMI; specifically, all participants in their study had diagnoses of schizophrenia or schizoaffective disorder. These authors also reported that the PCL has high internal consistency ($\alpha=.87$) with this sample. Additionally, the authors suggest that this measure provides adequate diagnostic accuracy ($AUC=.76$) when used

with the SMI population. Based on the authors' findings, they suggest a range of cut-off scores (49-54) for diagnosing PTSD in the SMI population depending on the risks associated with both false negatives and positives, but identified 54 at the optimal cut-point for this population. (Grubaugh et al., 2007). As a result, the cut point of 54 was used in the present study. The PCL does have the highest reading level of any of the measures used for this study. The word processor, Word 2007, indicates a reading grade level of 8.8 for this measure. It should be noted, that when participants completed the measures for the current study, there was always someone available to read the measure to participants or to answer any questions they may have had.

Posttraumatic cognitions inventory. The Posttraumatic Cognitions Inventory (PTCI; Foa et al., 1999) is a 33 item self-report measure aimed at assessing trauma-related thoughts and beliefs (See Appendix C). These items were generated by the authors based on clinical interviews and theories concerning the development and maintenance of PTSD. The PTCI consists of items relating to three areas: negative beliefs about self, negative beliefs about the world, and self blame for trauma. Each of the items are ranked by the individuals on a 7-point Likert scale in which 1 indicates "totally disagree" and 7 indicates "totally agree", with possible scores ranging from 33 to 231 and higher scores indicating more negative, trauma-related beliefs. In their validation study, Foa et al. reported that the median score for individuals who had experienced a trauma and met criteria for PTSD was 133.00 ($SD=44.17$). They also reported that the PTCI demonstrated good internal consistency ($\alpha=.97$) and test-retest reliability using Spearman Rho correlations ($P=.85$). Foa et al. supported their measure's convergent validity by reporting that it correlated highly with all scales of the Personal Beliefs and Reaction

Scale (Resick, Schnicke, & Markway, 1991), which assesses individuals' beliefs about safety, trust, power, esteem, self-blame, undoing, and rape. The developers also reported that the PTCI showed good sensitivity and very high specificity in identifying individuals with and without PTSD. This is written at a 7th grade reading level.

Difficulties in emotion regulation scale. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item self-report measure which assesses the extent to which individuals are aware of their emotions, are able to identify and regulate their emotions, are accepting of their emotions, and are able to maintain goal directed behavior and inhibit their impulses despite experiencing a strong affective state. The DERS (See Appendix D) utilizes a Likert-type scale in which the individual indicates how often a statement is true of them where 1 represents “almost never” and 5 represents “almost always”, with possible scores ranging from 36 to 180 and higher scores indicating greater emotion regulation difficulties. The developers examined this measure using undergraduate students at the University of Massachusetts Boston. The calculated descriptive statistics for men and women separately ($M=80.66$, $SD=18.79$ and $M=77.99$, $SD=20.72$, respectively). Gratz and Roemer reported that the measure has high internal consistency ($\alpha=.93$) and test-retest reliability ($r=.88$). According to the developers, this measure also has adequate construct based on the measure's strong correlations with other measures of emotion regulation and has adequate predictive validity based on its high correlations with behavioral outcomes associated with difficulties with emotion regulation (i.e., self injury and intimate partner violence). This measure is written at a 6th grade reading level.

Procedure

WMR participants were asked to complete pre-test measures of the PCL, DERS, and PTCI at the WMR orientation session. Participants then completed the 10-12 week WMR program. At the final WMR session, participants were asked to once again complete the PCL, DERS, and PTCI, which served as their post-treatment measures.

Chapter Five

Results

Descriptive Statistics and the Relationship between PTSD, Cognition, and Emotion

Data was available for 87 individuals. However, one participant's data was excluded from all analyses because he or she demonstrated a pattern of responses suggestive of a response set (i.e., endorsed only the least or most pathological response), indicating that the data was unreliable. Thus, the results presented below are based on a sample of 86 individuals (not all of whom completed the WMR curriculum).

Additionally, one individual demonstrated a response set on the PTCI at both pre- and post-test, suggesting this data was unreliable. As a result, this participant's data was excluded from all analyses conducted on the PTCI. An exploratory analysis was conducted in order to determine descriptive statistics for each of the three measures used in this study, as well as to determine the rate of probable PTSD in this sample based on PCL total scores. Total PCL scores at pre-test were available for 85 of the 86 individuals who comprised the total sample. The average score for this sample on the PCL was 46.99 ($SD=16.07$; range=19-85). Based on Grubaugh et al.'s (2007) recommended cut-off of 54 for probable PTSD in an SMI sample, 34.1% of participants met criteria for probable PTSD and 65.9% did not. Total PTCI scores at pre-test were available for 83 individuals. The mean PTCI score for this sample was 122.30 ($SD=37.56$; range=34-204). For the DERS, pre-test total scores were available for 81 individuals. The mean score on the DERS was 96.9 ($SD=24.95$; range=38-146). Descriptive statistics for the three measures are presented in Table 2.

A correlational analysis was conducted in order to better determine the relationship between WMR participants' self-reported levels of PTSD, negative cognitions related to trauma, and emotion regulation difficulties. The assumption of normality was met for each of the three variables entered into this analysis, as indicated by review of the skewness and kurtosis values provided by the SPSS software and an evaluation of the graphical representations of the distribution of the data. Results of the correlational analysis indicated that self-reported level of PTSD symptoms was significantly, positively correlated with both self-reported levels of posttraumatic cognitions, $r=.65$ ($p<.01$, $N=82$) and self-reported difficulties with emotion regulation, $r=.62$ ($p<.01$, $N=80$); self-reported levels of posttraumatic cognitions and difficulties with emotion regulation were also significantly, positively correlated, $r=.74$ ($p<.01$, $N=80$). This corresponds to self-reported level of posttraumatic cognitions accounting for 42.3% of the variance in self-reported levels of PTSD symptoms and self-reported levels of difficulties with emotion regulation accounting for 38.4% of the variance in self-reported levels of PTSD symptoms. These findings demonstrate that as participants' self-reported levels of PTSD symptoms increase, both their self-reported severity of negative cognitions about themselves, others, and the world and their self-reported difficulties with regulating their negative emotions also increase. In addition, as participants' self-reported severity of trauma-related cognitions increase, their self-reported difficulties with regulating emotions also increase. Correlation coefficients for the three measures are presented in Table 2.

Changes in PTSD Symptom Levels, Posttraumatic Cognitions, and Emotion Regulation from Pre- to Post-WMR.

In order to test the hypotheses that participants’ self-reported levels of PTSD symptoms, trauma-related cognitions, and difficulties with emotion regulation would significantly decrease from pre- to post-WMR, a series of dependent samples *t* tests were conducted.

Table 2
Descriptive Statistics and Correlation Table

Measure	Descriptives			Correlation (<i>r</i>)		
	N	<i>M</i> or %	<i>SD</i>	PCL	PTCI	DERS
PCL	85	46.99	16.07		.65**	.62**
Probable PTSD	29	34.1%				
No Probable PTSD	56	65.9%				
PTCI	83	122.30.	37.55	.65**		.74**
DERS	81	96.90	24.95	.62**	.74**	

Note. PCL=Posttraumatic Stress Disorder Checklist; PTCI=Posttraumatic Cognitions Inventory; DERS=Difficulties in Emotion Regulation Scale; ** indicates $p < .01$.

A total of 38 individuals had complete pre- and post-test data for the PCL. A review of the skewness and kurtosis values of the sample of change scores, as well as the graphical representations of the data indicate that the assumption of normality was met. The mean PCL score for this sample at pre-WMR was 45.79 ($SD=17.20$) and at post-WMR was 41.26($SD=11.95$). Results of the dependent samples *t* test were significant, $t(37)=2.17$, $p=.037$, indicating that self-reported levels of PTSD symptoms significantly decreased from pre- to post-WMR. Cohen’s (1988) *d* was calculated as a measure of effect size for this dependent samples *t* test. Results of this dependent samples *t* test correspond to a small to medium effect of WMR on self-reported levels of PTSD symptoms ($d=.31$). Results of this analysis are presented in Table 3.

Given that most research studies that have evaluated the efficacy of a particular treatment for PTSD have utilized samples comprised of only individuals who meet criteria for PTSD, a dependent samples *t* test was conducted to examine the change in PCL scores from pre- to post-test for only those individuals who met criteria for probable PTSD at pre-test. Pre- and post-test data was available for 12 individuals who met criteria for probable PTSD. A review of the values for skewness and kurtosis and the graphical representations of the data indicated that the assumption of normality was met. The mean PCL score for individuals with probable PTSD at pre-test was 66.17(*SD*=10.61) and at post-test was 52.67 (*SD*=8.03). Results of the dependent samples *t*-test indicated that individual's self-reported levels of PTSD symptoms significantly decreased from pre- to post-WMR for those individuals who met criteria for probable PTSD at pre-test, $t(11)=3.41, p=.006$. The effect size for this analysis indicates that there was a large effect of WMR on self-reported level of trauma symptoms for those individuals who met criteria for probable PTSD as pre-test ($d=1.43$). Results of this analysis are presented in Table 3.

Table 3
Mean Changes from Pre- to Post-treatment on the PCL, PTCI, and DERS

Measure	N	Pre-Test		Post-Test		df	<i>t</i>	<i>p</i>	<i>d</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
PCL (All)	38	45.79	17.20	41.26	11.95	38	2.17	.037	.31
PCL (PTSD)	12	66.17	10.61	52.67	8.03	11	3.41	.006	1.43
PTCI	33	125.36	41.49	106.45	39.89	32	3.87	.001	.46
DERS	36	95.03	24.48	88.81	21.80	35	2.03	.050	.27

Individual change scores were also evaluated in order to determine whether individuals' PCL scores reliably changed from pre- to post-WMR as well as whether or

not individuals demonstrated a clinically meaningful change on the PCL from pre- to post-WMR. The National Center for PTSD (2014) recommends utilizing a minimum of a 5-point change to determine whether an individual has demonstrated reliable change on the PCL and a minimum of a 10-point change to determine whether or not the change is clinically meaningful. Using these cut points, results indicated that 47.4% of participants reliably improved from pre- to post-WMR, and 26.3% showed improvement that was clinically meaningful. Four participants (13.2%) both reliably deteriorated and demonstrated clinically meaningful deterioration from pre- to post-WMR.

In order to determine if self-reported levels of posttraumatic cognitions significantly decreased from pre- to post-WMR, a dependent samples *t* test was conducted examining the changes in PTCI total scores from pre- to post-test. Of the total sample, 33 individuals had complete pre- and post-test data for the PTCI. The assumption of normality was met for this test. Results of the dependent *t* test indicated that participants self-reported level of posttraumatic cognitions significantly decreased from pre- to post-WMR, $t(32)=3.87, p=.001$. These results indicate that WMR had a small to medium effect on self-reported levels of posttraumatic cognitions ($d=.46$). Results are presented in Table 3.

A final dependent *t* test was conducted in order to determine if participants' self-reported difficulty with emotion regulation significantly decreased from pre- to post-WMR. Of the total sample, 36 individuals had complete pre- and post-test data, and all assumptions were met for this test. Results of this *t* test were very nearly significant, $t(35)=2.03, p=.050$, indicating that the degree to which participants self-reported difficulties with emotion regulation decreased following completion of WMR, closely

approaching statistical significance. These results corresponded to a small effect of participation in WMR on participants' self-reported difficulties with emotion regulation ($d=.27$).

Relationship between changes in Cognition and Emotion Regulation and changes in PTSD Symptoms

In order to test the hypotheses regarding the relationship between changes in cognition and emotion regulation and their ability to predict changes in PTSD symptom severity, the remaining analyses utilized only data from participants who had complete pre- and post-test data for each of the three measures of interest. Of the 86 individuals for whom pre-test data was available, 30 individuals had complete and reliable pre- and post-test data on each of the three measures.

There are many reasons why post-test data may be unavailable for participants who completed pre-test data. For example, the participant may not have completed the WMR program, the participant may have completed the program but simply was not present on the day on which post-test data was taken, the WMR facilitators may not have requested that participants complete post-test data, or the completed data may have simply been lost. However, in order to increase the generalizability of the findings of this study, participants for whom only pre-test data was available (i.e., “non-completers”) were compared to participants for whom both pre- and post-test data was available (i.e., “completers”) on several factors. Independent samples t tests were conducted in order to determine whether or not “completers” and “non-completers” significantly differed on average age, PCL total scores at pre-test, PTCI total scores at pre-test, and DERS totals scores at pre-test.

Results indicated that the average age of “completers” ($M=44.76$; $SD=13.49$) was not significantly different from the average age of “non-completers” ($M=45.35$; $SD=10.21$), $t(72.23)=-.225$, $p=.823$ (t test statistic presented is based on the assumption that equal variances were not assumed as Levene’s Test for equality of variances was significant). Results also indicated that the average total score on the PCL for “completers” ($M=46.13$; $SD=16.83$) did not significantly differ from the average total score on the PCL for “non-completers” ($M=47.76$; $SD=15.51$), $t(83)=-.465$, $p=.643$. Results of the independent t test indicated that the mean PTCI at pre-test for “completers” ($M=124.92$; $SD=40.83$) was not significantly different from the mean pre-test PTCI score for “non-completers” ($M=120.20$; $SD=35.01$), $t(81)=.567$, $p=.572$. Similar results were found for the pre-test DERS scores. The mean DERS score for “completers” ($M=95.57$; $SD=24.36$) and “non-completers” ($M=98.02$; $SD=25.67$) were not significantly different, $t(79)=-.439$, $p=.662$. Results of these independent t tests are presented in Table 4.

Chi square analyses were used in order to determine whether or not there was an association between completion status and gender as well as an association between completion status and whether or not participants met criteria for probable PTSD at pre-treatment. Results indicated that there was neither an association between completion status and gender, $\chi^2(1)=.441$, $p=.507$ or an association between completion status and whether or not a participant met criteria for probable PTSD at pre-test, $\chi^2(1)=.088$, $p=.767$. In sum, these results strengthen the supposition that the subsample utilized for the remaining statistical analyses were representative of a larger, WMR sample as a whole.

Correlational analyses were conducted in order to better understand the relationship between changes in PCL, PTCI, and DERS scores from pre- to post-WMR.

In order to account for individuals' pre-test scores and regression to the mean

Table 4
Pre-test Comparisons of Completers and Non-Completers

Variable	Completers			Non-Completers			df	t	p
	N	M	SD	N	M	SD			
Age	40	44.76	13.49	45	45.35	10.21	72.23	-.225	.823
PCL Total	40	46.13	16.83	45	47.76	15.51	83	-.465	.643
PTCI Total	37	124.92	40.83	46	120.20	35.01	81	.567	.572
DERS Total	37	95.57	24.36	44	98.02	25.67	79	-.439	.662

residualized change scores were used rather than simple change scores for these correlational analyses. Residualized change scores were obtained by regressing individuals' post test scores of each measure on their respective pre-test scores. The residualized scores were saved utilizing SPSS software and then entered into a correlational analysis. Results of this analysis indicated that changes in total PCL scores from pre- to post-WMR were significantly, positively correlated with changes in total PTCI scores from pre- to post-WMR, $r=.36, p<.05$. This indicates that as self-reported levels of trauma symptoms decrease, self-reported levels of trauma cognitions decrease. Correlational results also indicated that changes in total PCL score from pre- to post-WMR were significantly, positively correlated with changes in total DERS scores from pre- to post-WMR, $r=.56, p<.001$, demonstrating that as participants self-reported trauma symptoms decrease, their self-reported difficulties with emotion-regulation decrease as well. Correlations are presented in Table 5.

Table 5
Correlations of Residualized Change Scores on PCL, PTCI, and DERS

Measure	PCL	PTCI
PCL	--	
PTCI	.36*	--
DERS	.56**	.76**

* $p < .05$; ** $p < .01$

In order to determine whether or not changes in PTCI scores and changes in DERS scores predicted changes in PCL scores as well as whether or not change in DERS scores better predicted changes in PCL scores than changes in PTCI scores, two hierarchical linear regressions were conducted. In the first hierarchical regression, the residualized PTCI change score variable was entered as the only predictor for residualized PCL change score variable; in Step 2, both residualized PTCI change scores and residualized DERS change scores were entered as predictors for residualized PCL change scores. Results of this analysis indicated that when entered as the sole predictor, change in PTCI scores significantly predicted change in PCL scores, $F(1,28)=4.24$, $p=.049$. The R square value for this analysis indicates that change in PTCI scores accounts for 13.2% of the variance of change in PCL scores. Cohen's f^2 effect size was calculated for this R square value ($f^2=.15$), which corresponds to a medium effect. Traditional benchmarks for f^2 indicate that .02, .15, and .35 correspond to small, medium, and large effects, respectively. Results of the second step of the analysis demonstrated that when change in PTCI scores and change in DERS scores were entered simultaneously as predictors, the total model was significant, $F(2, 27)=4.48$, $p=.005$. Furthermore, an evaluation of the R and R square values indicates that together, change in PTCI scores and change in DERS scores accounts for 32.0% of the variance in change in PCL scores. The explanation of an

additional 18.8% of the variance in change in PCL scores provided by Model 2 resulted in a statistically significant increase in variance explained; $F_{\text{change}}(1,27)=7.48, p=.005$. Thus, the explanatory power of changes in PTCI and DERS scores in combination is significantly greater than the explanatory power of change in PTCI scores alone when attempting to predict changes in PCL scores. Results are presented in table 6.

Furthermore, an evaluation of the standardized coefficients for each of the predictors in the two models indicates that once change in DERS scores is entered into the model, changes in PTCI scores, which was significant as the sole predictor; $\beta=.36, p=.049$, is no longer significant; $\beta=-.14, p=.58$; however, change in DERS scores is significant; $\beta=.66, p=.01$. This confirms the hypothesis that both change in PTCI scores and change in DERS scores are significant predictors of changes in PCL scores. However, the results suggest that change in DERS scores emerge not only as a better predictor than change in PTCI scores but also that when changes in DERS scores are entered into the model, changes in PTCI scores are no longer necessary to predict changes in PCL scores. Beta Coefficient values are presented in Table 6.

Table 6
Hierarchical Regression Analysis 1: Predicting Changes in PCL Scores^a; N=30

Step and Predictor Variable(s) ^b	R	R ²	R ² Change	F Change	F	β
Step 1	.36	.13	.13	4.24*	4.24*	
PTCI						.36*
Step 2	.57	.32	.19	7.48*	6.35**	
PTCI						-.14
DERS						.66*

^aResidualized change scores used for the dependent variable, PCL; ^bResidualized change scores are used for predictors; * $p<.05$; ** $p<.01$

All assumptions for this regression analysis were met based upon the guidelines provided by Field (2009), apart from the assumption of collinearity. The correlation

between change in PTCI scores and change in DERS score is highly correlated ($r=.76$), but it is below Field's recommended cut-off of 0.8 for collinearity. However, the change of the sign for the standardized Beta coefficient for change in PTCI scores from positive in Step 1 to negative in Step 2 of the model, suggests some problems with collinearity between the predictors. As a result, the individual interpretation of the Beta coefficients for each of the predictors relative to the dependent variable should be carried out with some caution, because the values of the Beta coefficients are likely unstable.

In order to more clearly examine the contribution of each individual predictor, an additional hierarchical linear regression was conducted in which change in DERS scores was entered as the only predictor in Step 1 and change in DERS scores and change in PTCI scores were entered simultaneously in Step 2. Results of this regression analysis indicated that when entered as the sole predictor, change in DERS scores significantly predicted change in PCL scores $F(1,28)=12.69, p=.001$. The R square value for this analysis indicated that change in DERS scores accounts for 31.2% of the variance in change in PCL scores. Cohen's f^2 was calculated for this R square value ($f^2=.45$). This corresponded to a large effect. Unlike in the initial regression analysis where adding change in DERS scores as a predictor in Step 2 resulted in a statistically significant increase in percent of variance of change in PCL scores explained, results of this analysis indicated that adding change in PTCI scores as a predictor in Step 2 does not result in a statistically significant increase in R^2 ; $F_{\text{change}}(1,27)=.321, p=.58$. Complete results are presented in table 7. This further supports the interpretation from the first hierarchical regression that change in PTCI scores are not necessary to predict change in PCL scores when change in DERS scores is available as a predictor.

Table 7
Hierarchical Regression Analysis 2: Predicting Changes in PCL Scores^a; N=30

Step and Predictor Variable(s) ^b	R	R ²	R ² Change	F Change	F	β
Step 1	.56	.31	.31	12.69**	12.69**	
DERS						.56**
Step 2	.57	.32	.01	.32	6.35**	
DERS						.66**
PTCI						-.14

^aResidualized change scores used for the dependent variable, PCL; ^bResidualized change scores are used for predictors; **p<.01

Chapter Six

Discussion

Results of the present study supported the hypotheses that individuals' self-reported levels of PTSD symptoms and negative, trauma-related cognitions would significantly decrease from pre- to post-WMR. Although it was hypothesized that individuals' self-reported levels of emotion regulation difficulties would significantly decrease from pre- to post-WMR, results of the present study did not support this hypothesis. However, results indicate that individuals' self-reported emotion regulation difficulties did decrease to a degree that was at the threshold of statistical significance ($p=.050$). The results showed that severity of self-reported negative, trauma-related cognitions and difficulties with emotion regulation were significantly correlated with self-reported PTSD symptom severity prior to beginning the WMR program. Furthermore, it was hypothesized that both participants' self-reported changes in negative, trauma-related cognitions and emotion regulation difficulties would be significantly correlated with their self-reported changes in PTSD symptom levels from pre- to post-WMR. The results of the present study supported both of these hypotheses.

It was also hypothesized that both participants' changes in self-reported trauma-related cognitions and difficulties with emotion regulation would significantly predict their self-reported changes in PTSD symptom levels from pre- to post-WMR. The results of the present study support these hypotheses. Finally, it was hypothesized that participants' self-reported changes in emotion regulation difficulties would better predict self-reported changes in PTSD symptoms from pre- to post-WMR than would self-

reported changes in negative, trauma-related cognitions. The results of the present study provide qualified support for this hypothesis.

Prevalence of PTSD and WMR's Impact on PTSD Symptoms

The rate of probable PTSD in the present sample (34.1%) is somewhat lower than the rate of probable PTSD reported by Lee's (2011) sample of WMR participants; however, it is consistent with the findings of Mauritz et al.'s (2013) meta-analysis that reported that the average rate of PTSD in an SMI sample was 30%. The results of this study add to the extensive research that has demonstrated that the rate of PTSD in individuals with SMI is approximately three times the rate of PTSD in the general population (Kessler et al., 2005), highlighting the need for effective trauma treatments for these individuals. The present study did replicate the findings of Lee (2011), as both studies demonstrated that self-reported PTSD symptoms significantly decreased following participation in the WMR program. Though this finding may be somewhat surprising given WMR's lack of components that directly address PTSD symptomatology, the results of Sloan et al. (2013) suggest that the results of the present study are consistent with previous research. Sloan et al. conducted a meta-analysis of 17 studies in order to examine the effectiveness of group trauma treatment. When analyzing results from 10 studies in which a trauma-focused treatment was compared to a nonspecific active comparison, Sloan et al. found that trauma-focused group treatments and nonspecific group treatments had comparable effects on PTSD symptom severity.

For example, Classen et al. (2011) reported findings consistent with this conclusion in their study examining PTSD treatment outcomes with 166 women who had experienced childhood sexual abuse. This study compared trauma-focused group

treatment (TFGT), present-focused group treatment (PFGT), and a waitlist control. Authors reported that the TFGT included an active exploration of trauma memories in which participants were encouraged to share and examine their memories. PFGT focused on restructuring views of self and others and on improving relational patterns. In this treatment, participants were redirected to the here-and-now in their discussions. Both group treatments took place over the course of 24 sessions and were manualized. Classen et al. found that both treatments were more effective in reducing PTSD symptoms than was the waitlist control. Moreover, no significant differences were found between the TFGT and PFGT. These findings demonstrate the necessity of additional research on group therapy and PTSD in order to identify the particular components of treatment that facilitate the greatest reduction in PTSD symptoms.

A comparison of the magnitude of the effect of WMR on PTSD symptom severity in the present study to effect sizes reported in the literature support Sloan et al.'s (2013) position. Although the effect size reported in this study for the overall sample of participants who completed the WMR program is smaller ($d=.31$) than many of the effect sizes reported in the literature, it would not be appropriate to compare these two results. The research presented in the literature is predominantly focused on examining the effect of PTSD treatments on only individuals who meet criteria for PTSD. Thus, it would be more appropriate to compare the effect size reported in this study for the effect of WMR on participants who met criteria for probable PTSD at pre-test ($d=1.43$). This effect size is comparable and sometimes larger than those reported in the literature for trauma-focused group treatments. For example, Castillo et al. (2014) reported an effect size of .54 for their effect of group CPT on a sample of women veterans. Additionally, Jeffrey's

et al. (2014) reported that the effect size for veterans who had completed CPT in either individual, group, or individual plus group formats as being .96—a large effect, but smaller than the one found in the present study.

The effect found in the present study is also in line with those reported in studies examining PTSD treatments for individuals with SMI. The effect sizes reported by these studies (Frueh et al., 2009; Lu & Fite, 2009; Mueser et al., 2007; Mueser et al., 2008; Rosenberg, Mueser, Jankowski, Salyers, & Acker, 2004) ranged from .63 to 1.12, representing individual, group, and individual plus group treatments. These comparisons suggest that WMR is as effective in treating PTSD symptom severity as other group treatments aimed at reducing PTSD symptomatology in SMI and non-SMI populations. Due to the lack of research on effective treatments for individuals with comorbid PTSD and SMI, as well as the lack of research indicating a gold-standard group treatment for PTSD for any population, the present study sought to examine the mechanisms of change that promoted a reduction in participants' self-reported decrease in PTSD symptoms.

The Role of Cognition in WMR's impact on PTSD Symptoms

Because the predominating theories of PTSD (Ehlers & Clark, 2000; Foa & Kozak, 1986) and the newest criteria for PTSD presented in the DSM-5 (American Psychiatric Association, 2013) emphasize the role of cognition in the maintenance and development of PTSD, participants' self-reported level of trauma-related cognitions were examined. Consistent with these theories and the previous literature drawing upon samples of both individuals with and without SMI (Ford & Fournier, 2007; Kilcommons & Morrison, 2005; Lommen & Restifo, 2009; Owens et al., 2001; Sobel et al., 2009), the present study demonstrated a clear association between self-reported trauma-related

cognitions and PTSD symptom severity at pre-test, in which more negative, trauma related beliefs was positively associated with more severe PTSD symptoms.

The severity of trauma-related beliefs reported by participants prior to beginning WMR ($M=125.36$) is also comparable to the severity of participants in previous research. For example, Hagedaars et al. (2010) reported that the average PTCI score at pre-test was 124.99 for their sample of individuals receiving services at an outpatient clinic. Similarly, Foa and Rauch (2004) reported a pre-test mean score on the PTCI in their PE trial as being 134.50. Though comparable to these two non-SMI samples, the mean score on the PTCI for the present study was somewhat lower than the pre-test average PTCI score (156.84) reported by Mueser et. al (2007) in their study examining the effectiveness of the “Trauma Recovery Group” in reducing PTSD in individuals with SMI.

The present study found that participants’ self-reported trauma-related cognitions significantly decreased from pre- to post-WMR even though the WMR curriculum does not focus on identifying and challenging trauma-related beliefs or address trauma at all. However, as Hagedaars et al. (2010) points out when discussing the reduction of negative cognitions following the completion of the PE protocol, this finding does not have to be incompatible with cognitive theories of PTSD (Ehlers & Clark, 2000; Foa & Kozak, 1986). WMR may have an underlying exposure component that helps to disconfirm trauma-related cognitions through the introduction of new, incompatible information during the group therapy process. For example, WMR is heavily focused on reducing stigma and empowering individuals, and the discussion of such topics may reduce participants’ beliefs that they are incompetent or damaged. This would significantly

impact participants' PTCI scores, as the largest proportion of items on this measure focuses on negative cognitions about the self.

Also in support of the cognitive theories of PTSD presented by Ehlers and Clark (2000) and Foa and Kozak (1986) is the present study's finding that participants' self-reported decrease in negative, trauma-related cognitions is significantly associated with their self-reported decrease in PTSD symptoms. Furthermore, the magnitude of this relationship ($r=.36$) is comparable, but somewhat less, to those reported in the literature. Foa and Rauch (2004) and Hagenaars et al. (2010) utilized statistical methods similar to the ones used in the present study to examine the relationship between change in cognition and change in PTSD symptoms and reported a strong relationship between the two ($r=.58$ and $r=.60$, respectively). The importance of change in cognition relative to PTSD symptomatology in individuals with SMI as demonstrated by correlational analyses is comparable to those individuals who do not have SMI, suggesting that interventions that encourage individuals to challenge and change their trauma-related cognitions would be beneficial to those struggling with PTSD. However, the weaker association between cognition and PTSD symptom severity in the present SMI sample than in previous research studies utilizing predominantly non-SMI samples suggests that treatments for PTSD developed for individuals without SMI may need to be modified in some ways in order to reach the treatment's highest level of efficacy when utilized with individuals with SMI.

The Role of Emotion Regulation in WMR's impact on PTSD Symptoms

The present study found that difficulties with emotion regulation were significantly correlated with PTSD symptomatology at pre-test ($r=.62$), supporting the

findings of previous research that have demonstrated an association between emotion regulation and PTSD symptoms (Ehring & Quack, 2010; Frewen et al., 2012; Price et al., 2006). This finding is also consistent with the added DSM-5 criterion for PTSD, “persistent negative trauma-related emotions” (American Psychiatric Association, 2013). Furthermore, the strength of the relationship between emotion regulation and PTSD symptom severity ($r=.62$) in the present SMI sample prior to beginning the WMR program is commensurate to the strength of the relationship reported in previous studies. For example, Frewen et al. reported that the correlation between participants’ total scores on the DERS and a measure of PTSD symptom severity was .60. Additionally, Ehring & Quack (2010) reported that the correlations between participants’ responses on each of the subscales of the DERS and their PTSD symptom severity ranged from .34 to .52. The present study indicates that the relationship between emotion regulation difficulties and PTSD symptom severity in individuals with SMI is just as strong, if not stronger, than the relationship between these two constructs in predominantly non-SMI samples reported by previous research.

Also emphasizing the important role of emotion regulation is the finding that changes in emotion regulation difficulties from pre- to post-WMR is significantly correlated with changes in PTSD symptom severity. This strong association ($r=.56$) is consistent with findings of previous research that have examined the role of emotion regulation in treatment outcomes for PTSD. Price et al. (2006) reported that participants’ changes in responses on two measures—one measuring ability to adaptively regulate emotions and one measuring fear of experiencing emotion and losing control of internal and behavioral reactions to one’s emotions—were significantly correlated with their

changes in PCL scores. Additionally, Kearney et al. (2012) reported that changes in mindfulness skills, which are thought to be related to emotion regulation abilities (Creswell et al., 2007; Warren et al. 2003), were significantly associated with changes in PTSD symptom severity. The present study suggests that the association between changes in emotion regulation and changes in PTSD symptoms demonstrated by research utilizing non-SMI samples is also true and relevant to the understanding, and potentially the treatment, of comorbid SMI and PTSD.

Findings of this study indicate that participants' self-reported levels of emotion regulation difficulties decreased from pre- to post-test to a degree that very nearly reached significance ($p=.05$). Furthermore, compared to changes in self-reported PTSD symptoms and in negative, trauma-related cognitions, the magnitude of effect for WMR on emotion regulation difficulties was the smallest. This indicates that there is little in the current WMR curriculum to strongly enhance the emotion regulation skills of its participants. Should WMR want to enhance the emotion regulation skills of their participants to a more significant degree, the inclusion of mindfulness exercises as part of the curriculum may be beneficial (Arch & Craske, 2006; Chambers et al., 2009; Creswell et al, 2007; Warren et al., 2003).

Cognition, Emotion Regulation, and PTSD Symptom Severity

Correlational analyses reported in this study provide preliminary support to the relative importance of negative, trauma-related cognitions and emotion regulation regarding PTSD symptom severity in individuals with SMI who participated in the WMR program. First, the strength of the association between emotion regulation difficulties and PTSD symptom severity and between negative, trauma-related cognitions and PTSD at

the start of WMR is nearly identical for this sample of individuals. Second, the results of the present study demonstrate that the association between participants' self-reported changes in emotion regulation difficulties and changes in PTSD symptoms is stronger than the relationship between participants' self-reported changes in negative cognitions and PTSD symptoms. These results alone suggest that group—and potentially individual—treatments developed for individuals with comorbid PTSD and SMI may want to provide interventions focused on emotion regulation in addition to those focused on modifying negative, trauma-related beliefs.

This conclusion is further supported by the results of the regression analyses conducted in this study. As hypothesized, both changes in negative, trauma-related cognitions and changes in emotion regulation difficulties significantly predicted changes in PTSD symptom severity. However, despite participants reporting statistically significant changes in negative, trauma-related beliefs from pre- to post-WMR and the magnitude of effect of WMR on cognitions being greater than that for changes in emotion regulation, changes in cognition was not a significant predictor of changes in PTSD symptom severity when self-reported changes in emotion regulation difficulties were also entered into the analysis. Furthermore, the results demonstrate that adding knowledge of participants' changes in emotion regulation difficulties to their changes in cognition significantly enhances one's ability to predict participants' changes in PTSD symptom severity. However, adding knowledge of participants' changes in trauma-related beliefs to knowledge of participants' changes in emotion regulation did not enhance one's ability to predict participants' changes in PTSD symptoms severity. Thus, the results of the present study suggest that changes in emotion regulation were paramount to being able to

most effectively predict changes in PTSD symptom severity and that changes in cognition alone are not enough to effectively predict changes in PTSD symptoms for individuals with comorbid PTSD symptomatology and SMI.

These findings are consistent with studies that have reported a significant reduction in PTSD symptomatology after participation in treatment programs that include interventions known to enhance emotion regulation skills (Kearney et al., 2012; Kimbrough et al., 2010; King et al., 2013; Steil et al., 2011). Kearney et al. (2012) reported in their study of a MBSR program, increased mindfulness skills mediated the relationship between participation in the program and change in PTSD symptoms. Although emotion regulation was not directly assessed in this study, research (Arch & Craske, 2006; Creswell et al., 2007; Warren et al., 2003) has made a clear connection between mindfulness skills and emotion regulation skills. Thus, the current findings are consistent with the findings of Kearney et al. that implicate enhanced emotion regulation skills as an important pathway through which recovery from PTSD may take place.

The additive impact of improved emotion regulation on PTSD recovery was clearly demonstrated in a recent study conducted by Bohus et al. (2013). Their study compared the effectiveness of DBT-PTSD to treatment as usual (TAU) with women who had suffered childhood sexual abuse and who had been identified as having treatment resistant-PTSD. Inclusion criteria included meeting one of the following criteria: a current eating disorder, current major depressive disorder, current substance abuse, or meet at least four of the criteria for BPD. As described by the authors of this study, DBT-PTSD integrates the components of cognitive and exposure treatments for PTSD with DBT skills and principles. Furthermore, DBT-PTSD was implemented in a residential

treatment program and consisted of both individual and group therapy modalities and lasted for 12 weeks. Bohus et al. (2013) reported that participants in the DBT-PTSD group demonstrated a significantly greater reduction in PTSD symptoms than did a TAU comparison group that corresponded to large between-group effect sizes. While the authors did not report the type of treatment that participants received prior to participating in this study, it seems that likely that some of them had received some type of trauma-focused, cognitive treatment. Thus, it is plausible that one reason for the success of this treatment was the addition of interventions focused on increased emotion regulation skills.

Given that research (Sloan et al., 2013) has indicated that no particular type of group treatment—trauma-focused or present focused—has been demonstrated to be more efficacious than another, the findings of the current study demonstrating that changes in emotion regulation skills were better predictive of changes in PTSD symptoms than changes in negative, trauma-related beliefs in a group of individuals with SMI seem especially important. This finding suggests that group treatments for individuals with SMI, and potentially for those without SMI, for PTSD could be enhanced by combining interventions focused on cognition and emotion regulation.

Limitations of the Present Research

There are several limitations to the findings of the present study. One limitation to the current research is that it is part of an on-going open clinical trial that does not include a comparison treatment or control group. As a result, it cannot be definitively concluded that individuals' significant decrease in PTSD symptomatology and negative, trauma-related beliefs, and nearly significant decrease in emotion regulation difficulties

from pre- to post-WMR were solely the result of the WMR intervention. For example, WMR participants are concurrently receiving other mental health services, (e.g., case management, individual therapy, medication management) which may also contribute to the significant decrease in individuals' self-reported levels of PTSD symptomatology and negative, trauma-related beliefs, and nearly significant decrease in emotion regulation difficulties from pre- to post-WMR. Additionally, the lack of information regarding those individuals who chose not to complete the WMR program limits the conclusions that can be drawn from this study, as these conclusions may not be appropriate to apply to those individuals who failed to complete the WMR program.

A third limitation to the current study relates to the measure used to assess PTSD symptomatology. The PCL-C asks about symptoms in relation to "stressful experiences" and cannot determine if the respondent meets Criterion A for PTSD. Elhai and Naifeh (2012) argue that nonspecific and global assessments approaches to PTSD assessment may inflate PTSD rates because the individual's reference point when completing the measure cannot be determined. The extent and type of trauma exposure as related to outcomes and WMR are of great import and are areas in need of additional study. For example, Ehring and Quack (2010) found that those individuals who had experienced an interpersonal trauma had greater emotion regulation difficulties than individuals who had experienced some other type of trauma. Thus, a closer examination of the types of trauma WMR participants experienced is needed in order to determine whether the extent to which changes in emotion regulation skills impact changes in PTSD symptoms differs depending upon the type of trauma experienced. However, due to the manner in which the PCL-C was administered (i.e., by the group facilitators at the mental health sites

rather than researchers), and the relatively small sample size obtained (described below) these questions were beyond the scope of this study.

A fourth limitation to the current sample relates to the relatively small sample sizes used in the analyses. Reliable pre-test data was collected for 86 individuals. However, post-test data was available for far fewer individuals. Although specifics are unknown, this is likely the result of participant drop-out, the failure of group-facilitators to collect post-test data, participants' refusal to complete the data a second time, participant absence on the day post-test data was collected, or the failure of the group-facilitators to return completed data to the researchers. Three of the four primary *t*-tests conducted for this study, were at or above .80 power, as indicated by G*Power (Erdfelder, Faul, & Buchner, 1996); however, the power for the sample size (n=12) used to assess changes in PTSD symptoms from pre- to post-WMR for only individuals who met criteria for probable PTSD reached only .35. While a significant effect was found for this sample, such a small sample size reduces the generalizability of the findings to the larger WMR sample, as well as to the SMI population as a whole. The sample size used for the regression analyses was also undesirably low. Significant medium to large effects were found for these analyses; however, a post-hoc power analysis indicated that the power achieved in this study was only .42. In order to have achieved .80 power, the sample sized would have had to reach 68 individuals. While significant effects were reported, this small sample size also limits the generalizability of the findings to other WMR participants as well as to the greater SMI population.

A final limitation to the present study relates to the correlation found between the measures used to assess emotion regulation difficulties and negative, trauma-related

beliefs. This correlation resulted in collinearity in the regression analysis, making it difficult to accurately measure the individual contribution of change in emotion regulation and cognition on the model. Put more simply, it reduces the extent to which one can definitively determine the unique impact each construct had on PTSD symptom relief.

Clinical Implications and Future Research

Despite these limitations, the clinical implications of this study are many. First, this study suggests valuable changes that could be made to the WMR curriculum. The results of the present study demonstrated that participation in WMR is associated with a decrease in emotion regulation difficulties. Future research is warranted in order to better understand the mechanism through which WMR enhances emotion regulation to the degree that it does. Questions remain as to whether this increase in emotion regulation skills relates to enhanced mindfulness skills or whether it is achieved through some other pathway. Since the effect of WMR on emotion regulation skills is small, changes to the WMR curriculum may be needed in order to further enhance participants' abilities to regulate their negative emotions. WMR may draw on research that has shown that increased mindfulness skills aids in emotion regulation (Arch & Craske, 2006; Creswell et al., 2007; Warren et al., 2003) and include instruction on mindfulness to the curriculum. The inclusion of a mindfulness module may be especially beneficial given the results of the present study which demonstrate that changes in emotion regulation difficulties are a better predictor of changes in PTSD symptoms severity than are changes in trauma-related cognitions. Future research is warranted in order to examine the full impact of a mindfulness module on WMR participants—including whether or not this

enhances participants' mindfulness skills and the degree to which their emotion regulation difficulties and PTSD symptoms are decreased.

A second implication relates to the pathway through which negative, trauma-related cognitions can be changed. The results of the present study demonstrate that trauma-related cognitions can be reduced without having to discuss the traumatic event itself or the trauma-related cognitions individuals may have. This is particularly important for individuals who may not feel comfortable discussing a traumatic event or the beliefs that they have developed as a result of the event. As Hagedaars et al. (2010) note in their study, which demonstrated a reduction in posttraumatic cognitions following participation in PE, exposures and/or other methods of treatment may introduce information that is incompatible with individuals' trauma-related beliefs and promote adaptive changes to these cognitions. The literature would be benefited by studies that examine changes in trauma-related beliefs following participation in treatments that are less overtly cognitive in nature in order to increase our understanding of methods by which trauma-related cognitions can be changed.

To date, those studies evaluating the effectiveness of both group and individual treatments for individuals with comorbid PTSD and SMI have focused on treatments based on the cognitive theories of PTSD (Ehlers & Clark, 2000; Foa & Kozak, 1986), and these treatments have proven to be effective (de Bont et al., 2013; Frueh et al., 2009; Lu & Fite., 2009; Mueser et al., 2007; Mueser et al., 2008; Rosenberg et al., 2004). However, the results of the present study, which also utilized an SMI sample, suggest that given that changes in emotion regulation difficulties better predict changes in PTSD symptoms than changes in cognitions, the effectiveness of these treatment protocols may

be augmented by the addition of instruction on mindfulness and other emotion regulation skills. One reason that the research on PTSD treatments for this population remains limited is because a majority of research on treatments for PTSD excludes individuals with diagnoses such as schizophrenia and bipolar disorder (Bohus et al., 2013; Foa & Rauch, 2004; Kearney et al., 2012; Kimbrough et al., 2010; Resick et al., 2002). Future research is needed in order to determine the effectiveness of treatment protocols that integrate interventions that focus on both cognition and emotion regulation skills for the treatment of individuals with comorbid PTSD and SMI.

A final implication of the present study is that it adds to the literature which has already demonstrated emotion regulation as an important component of PTSD recovery, regardless of the presence of an SMI diagnosis (Kearney et al., 2012; Kimbrough et al., 2010; King et al., 2013; Steil et al., 2011). The availability of research on treatments focused on increasing emotion regulation skills in individuals with PTSD still remains limited compared to the research on cognitive treatments for PTSD, and additional research in this area is warranted. Harned et al. (2014) has already demonstrated the feasibility of integrating cognitive and emotion regulation interventions in their study on DBT-PE. The authors reported that adding emotion regulation components used in DBT to a standard PE protocol significantly reduced PTSD symptoms in their participants. Especially in light of Sloan et al.'s (2013) report that no group treatment—trauma-focused or present focused—has been demonstrated to be a gold standard treatment for PTSD, research is needed in order to examine the efficacy of treatments that integrate cognitive and emotion regulation interventions for PTSD in both group and individuals formats.

Summary and Conclusions

The present study examined the impact of changes in negative, trauma-related beliefs and emotion regulation difficulties on changes in PTSD symptom severity in individuals with SMI who had completed the WMR program. The relationship between self-reported trauma-related cognitions and PTSD symptoms as well as self-reported emotion-regulation difficulties and PTSD symptoms was strong for individuals who had agreed to participate in the WMR program. Furthermore, changes in trauma-related cognitions as well as changes in emotion regulation difficulties were associated with changes in PTSD symptoms from pre- to post-WMR for those individuals for which complete pre- and post-test data was available. Changes in emotion regulation provided greater explanatory power for changes in PTSD symptoms than did changes in negative, trauma-related beliefs. Thus, group treatments designed to address PTSD symptomatology in individuals with SMI should strongly focus on interventions aimed to increase emotion regulation abilities. At a minimum, PTSD treatments for this population that utilize cognitive strategies should integrate emotion regulation interventions into their treatment protocol.

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Appendix A

ADULT RESEARCH PARTICIPANT - INFORMED CONSENT FORM

Title of Project: Wellness Management and Recovery (WMR) Program

Principal Investigator: Wesley A. Bullock, Ph.D. 419-350-2717

Other Investigators: Julie Sage, M.A. Danelle Hupp, M.A. Tanya Ozbey
Megan Bodine, Alisha Lee, Brittany Tenbarger

Purpose:

The University of Toledo (UT), working with the Ohio Coordinating Center of Excellence for Wellness Management and Recovery (WMR), is inviting people to take part in a clinical service and research project. The research project is under the direction of Wesley A. Bullock, Ph.D. The goal of this project is to evaluate the effectiveness of the WMR program.

Description of Procedures:

The WMR program is based on clinical best practices promoted by the Ohio Department of Mental Health. WMR is a psycho-educational program that helps people gain knowledge and skills to cope better with their mental health problems, work towards health and wellness goals, and gain more control over their lives. The WMR program helps people work with their mental health team so that they are at less risk for illness and can cope better with their symptoms. Recovery happens when people discover their strengths and abilities to pursue their goals and get a sense of identity beyond their mental health problems.

The WMR program is provided in a group format, with about eight persons in each WMR group. The WMR program is 10 sessions long. Each session is two hours, with a 10 minute break in the middle. Your feedback and feedback from your WMR group leaders will be used to evaluate how well the program is working.

As a WMR research participant, you will complete a group of self-report, opinion measures at three times: (1) before starting in the WMR program, (2) after the WMR program is completed, and (3) six months after the WMR program. The outcome measures include: 1) the Mental Health Recovery Measure (30 items), 2) The WMR Client Self-Report Scales (27 items), and 3) The WMR Social Support Questionnaire. These measures take about an hour to finish. The measures ask for your opinion about your mental health symptoms, your quality of life, and your mental health recovery. These measures will also be used by your WMR treatment provider to help fit the WMR program to best meet your needs and wellness goals.

Voluntary Participation:

Your participation in the WMR program and taking the research measures is *voluntary*.

You do not need to answer any question that you do not want to, and you may stop participating in the program or its evaluation at any time. You will continue to receive your regular care from your mental health provider whether or not you participate.

If you choose not to participate, or decide to withdraw from this project, it will *not* affect your current or future relationship with the agency providing you services, or with the University of Toledo.

If you revoke your consent to participate, your data will not be used in any project analysis, so long as no irreversible use of the data has been made, such as the publication of summary results

Confidentiality:

All of the data we collect to assess the WMR program will be kept *confidential*. The consent forms with signatures will be kept apart from the measures. *Your name will not be used on research records* – only an ID number. Only group data or group themes, not individual responses, will be reported in any publication coming from the outcome evaluation of this project. The researchers will make every effort to prevent anyone who is not on the research team from knowing that you provided this information, or what that information is. Although we will make every effort to protect your confidentiality, there is a low risk that

this might be breached. All data collected will be kept for 5 years following the end of the project and then will be destroyed.

Potential Risks:

There are minimal risks to participation in this study, including loss of confidentiality. Participation in the WMR program offers you a chance to change, grow, and take responsibility for your life; change can be difficult and you run the risk of facing emotional issues that may be raised in the course of your participation.

Potential Benefits:

By volunteering for this program, you will have a chance to participate in a treatment program that is based on best clinical practices in mental health. The main goal of this program is to help people cope better with mental illness, and identify and pursue wellness goals that are important to them. Participating in the research evaluation may help our understanding of the recovery process for persons with mental health problems.

Contact Information:

Before you decide to take part in this study, please ask if you have any questions. If you have questions at any time you should contact the Principle Investigator (Wesley A. Bullock, Ph.D.) at 419-530-2717. If you have questions beyond those answered by the research team or your rights as a research participant or research-related injuries, please feel free to contact the Chairperson of the SBE Institutional Review Board, Dr. Barbara Chesney, in the Office of Research on the main campus at 419-530-2844.

Before you sign this form, please ask any questions on any part of this study that is not clear to you. You may take as much time as necessary to think it over. You will receive a copy of this consent form to keep.

SIGNATURE SECTION – Please read carefully

You are making a decision whether or not to take part in this research study. Your signature indicates that you have read the information provided above, you have had all your questions answered, and you have decided to take part in this research.

Note: Individuals who are not able to provide written consent must also have a signature by their legal guardian.

You, or your legal guardian, will be given a copy of this consent form to keep.

The date you sign this document to enroll in this study, that is, today's date must fall between the dates indicated at the bottom of the page.

Name of Participant (please print)	Signature	Date
Name of Legal Guardian (if required)	Signature	Date
Name of Person Obtaining Consent	Signature	Date

THE UNIVERSITY OF TOLEDO
SOCIAL, BEHAVIORAL & EDUCATIONAL INSTITUTIONAL REVIEW BOARD

The research project described in this consent form and the form itself have been reviewed and approved by the University of Toledo Social, Behavioral & Educational Review Board (SBE IRB) for the period of time specified below.

SBE IRB # : 105783

Approved Number of Subjects: 1,500

Project Start Date: 09/1/10

Project Expiration Date: 09/1/14

Appendix B

PTSD Checklist – Civilian Version (PCL-C)

WMR Pre _____ Post _____ Follow-up _____ Date _____

First Name _____ Birth date _____ Last 4 digits SSN _____

Instructions: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, put an “X” in the box to indicate how much you have been bothered by that problem *in the last month*.

No.	Response:	Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
1.	Repeated, disturbing <i>memories, thoughts, or images</i> of a stressful experience from the past?					
2.	Repeated, disturbing <i>dreams</i> of a stressful experience from the past?					
3.	Suddenly <i>acting or feeling</i> as if a stressful experience <i>were happening again</i> (as if you were reliving it)?					
4.	Feeling <i>very upset</i> when <i>something reminded</i> you of a stressful experience from the past?					
5.	Having <i>physical reactions</i> (e.g., heart pounding, trouble breathing, or sweating) when <i>something reminded</i> you of a stressful experience from the past?					
6.	Avoid <i>thinking about</i> or <i>talking about</i> a stressful experience from the past or avoid <i>having feelings</i> related to it?					
7.	Avoid <i>activities</i> or <i>situations</i> because <i>they remind you</i> of a stressful experience from the past?					
8.	Trouble <i>remembering important parts</i> of a stressful experience from the past?					
9.	Loss of <i>interest in things that you used to enjoy</i> ?					
10.	Feeling <i>distant</i> or <i>cut off</i> from other people?					
11.	Feeling <i>emotionally numb</i> or being unable to have loving feelings for those close to you?					
12.	Feeling as if your <i>future</i> will somehow be <i>cut short</i> ?					
13.	Trouble <i>falling</i> or <i>staying asleep</i> ?					

14.	Feeling <i>irritable</i> or having <i>angry outbursts</i> ?					
15.	Having <i>difficulty concentrating</i> ?					
16.	Being " <i>super alert</i> " or watchful on guard?					
17.	Feeling <i>jumpy</i> or easily startled?					

Weathers, F.W., Huska, J.A., Keane, T.M. *PCL-C for DSM-IV*. Boston: National Center for PTSD – Behavioral Science Division, 1991.

This is a Government document in the public domain.

Appendix C

Posttraumatic Cognitions Inventory

We are interested in the kind of thoughts which you may have had after a traumatic experience. Below are a number of statements that may or may not be representative of your thinking. Please read each statement carefully and tell us how much you AGREE or DISAGREE with each by putting the appropriate number between 1 & 7 in the box to the right of the statement. People react to traumatic events in many different ways. There are no right or wrong answers to these statements

1	2	3	4	5	6	7
<i>totally disagree</i>	<i>disagree very much</i>	<i>disagree slightly</i>	<i>neutral</i>	<i>agree slightly</i>	<i>agree very much</i>	<i>totally agree</i>

1.	the event happened because of the way I acted	
2.	I can't trust that I will do the right thing	
3.	I am a weak person	
4.	I will not be able to control my anger and will do something terrible	
5.	I can't deal with even the slightest upset	
6.	I used to be a happy person but now I am always miserable.	
7.	people can't be trusted	
8.	I have to be on guard all the time	
9.	I feel dead inside	
10.	you can never know who will harm you	
11.	I have to be especially careful because you never know what can happen next	
12.	I am inadequate	
13.	if I think about the event, I will not be able to handle it	
14.	the event happened to me because of the sort of person I am	
15.	my reactions since the event mean that I am going crazy	
16.	I will never be able to feel normal emotions again	
17.	the world is a dangerous place	
18.	somebody else would have stopped the event from happening	
19.	I have permanently changed for the worse	
20.	I feel like an object, not like a person	
21.	somebody else would not have gotten into this situation	
22.	I can't rely on other people	
23.	I feel isolated and set apart from others	
24.	I have no future	
25.	I can't stop bad things from happening to me	

26.	people are not what they seem	
27.	my life has been destroyed by the trauma	
28.	there is something wrong with me as a person	
29.	my reactions since the event show that I am a lousy copier	
30.	there is something about me that made the event happen	
31.	I feel like I don't know myself anymore	
32.	I can't rely on myself	
33.	nothing good can happen to me anymore	

Appendix D

Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item.

1-----2-----3-----4-----5
almost never sometimes about half the time most of the time almost always
(0-10%) (11-35%) (36-65%) (66-90%) (91-100%)

- _____ 1) I am clear about my feelings.
- _____ 2) I pay attention to how I feel.
- _____ 3) I experience my emotions as overwhelming and out of control.
- _____ 4) I have no idea how I am feeling.
- _____ 5) I have difficulty making sense out of my feelings.
- _____ 6) I am attentive to my feelings.
- _____ 7) I know exactly how I am feeling.
- _____ 8) I care about what I am feeling.
- _____ 9) I am confused about how I feel.
- _____ 10) When I'm upset, I acknowledge my emotions.
- _____ 11) When I'm upset, I become angry with myself for feeling that way.
- _____ 12) When I'm upset, I become embarrassed for feeling that way.
- _____ 13) When I'm upset, I have difficulty getting work done.
- _____ 14) When I'm upset, I become out of control.
- _____ 15) When I'm upset, I believe that I will remain that way for a long time.
- _____ 16) When I'm upset, I believe that I will end up feeling very depressed.
- _____ 17) When I'm upset, I believe that my feelings are valid and important.

1-----2-----3-----4-----5
almost never sometimes about half the time most of the time almost always
(0-10%) (11-35%) (36-65%) (66-90%) (91-100%)

- _____ 18) When I'm upset, I have difficulty focusing on other things.
- _____ 19) When I'm upset, I feel out of control.
- _____ 20) When I'm upset, I can still get things done.
- _____ 21) When I'm upset, I feel ashamed at myself for feeling that way.
- _____ 22) When I'm upset, I know that I can find a way to eventually feel better.
- _____ 23) When I'm upset, I feel like I am weak.
- _____ 24) When I'm upset, I feel like I can remain in control of my behaviors.
- _____ 25) When I'm upset, I feel guilty for feeling that way.
- _____ 26) When I'm upset, I have difficulty concentrating.
- _____ 27) When I'm upset, I have difficulty controlling my behaviors.
- _____ 28) When I'm upset, I believe there is nothing I can do to make myself feel better.
- _____ 29) When I'm upset, I become irritated at myself for feeling that way.
- _____ 30) When I'm upset, I start to feel very bad about myself.
- _____ 31) When I'm upset, I believe that wallowing in it is all I can do.
- _____ 32) When I'm upset, I lose control over my behavior.
- _____ 33) When I'm upset, I have difficulty thinking about anything else.
- _____ 34) When I'm upset I take time to figure out what I'm really feeling.
- _____ 35) When I'm upset, it takes me a long time to feel better.
- _____ 36) When I'm upset, my emotions feel overwhelming.