Testing the Association between Negative Appraisal and Traumatic Stress Symptoms among Community Clients with Serious Mental Illness

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Boston College

Graduate School of Social Work

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TESTING THE ASSOCIATION BETWEEN NEGATIVE APPRAISAL AND TRAUMATIC STRESS SYMPTOMS AMONG COMMUNITY CLIENTS WITH SERIOUS MENTAL ILLNESS

A dissertation

By

MARGARET VERONA SHERRER

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ABSTRACT

A compelling body of literature suggests that negative appraisal may be associated with adverse reactions to traumatic stress (Ehlers & Clark, 2000). However, very few studies have examined how cognitive appraisal influences posttraumatic adaptation in people with serious mental illness (SMI) despite evidence of disproportionately high prevalence rates of trauma exposure and Posttraumatic Stress Disorder (PTSD) in this population.

The major purpose of this study was to examine the relationship between negative appraisal and PTSD symptoms among adults diagnosed with SMI. It was hypothesized that negative appraisal would have a positive and significant association with traumatic stress symptoms in a clinical sample of community clients diagnosed with major mood and schizophrenia-spectrum disorders when controlling for gender, total lifetime trauma, substance use, and severity of symptoms associated with SMI. Multiple regression was employed to conduct a secondary analysis of clinical data from 291 community support clients who were receiving services from three community mental health centers in the state of Rhode Island during March to September 2009. Results supported the main hypotheses that all three types of negative appraisal with respect to *self, world /others,* and *self blame* as well as overall appraisal were positively and significantly associated with PTSD symptoms.

For Tom and Matt,
my cherished companions along the Camino,
with abiding love and gratitude

"Words mean more than what is set down on paper. It takes the human voice to infuse them with deeper meaning."

-Maya Angelou

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♦♦♦

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CHAPTER ONE

Introduction

"For there is nothing either good or bad, but thinking makes it so."
-Shakespeare, *Hamlet*

Study Purpose and Specific Aims

The quest for meaning is considered by many human behavior theorists to be a common adaptive response when coping with adversity throughout the lifespan. How an individual appraises or evaluates difficult life challenges has implications for one's emotional response, coping capacity, and, consequently for positive or negative adaptation to adverse events. As a theoretical construct, *appraisal* has been the subject of intense scrutiny among stress and emotion researchers for more than four decades (e.g. Arnold, 1960, Scherer, 2001; Lazarus & Folkman, 1984). More recent attention has been paid to how individuals construct meaning in the aftermath of traumatic events such as earthquakes, combat, life-threatening illness, and sexual assault with particular interest in how subjective interpretations of such events contribute to pathological responses or positive adaptation (e.g. Horowitz, 1986; Foa & Kozak, 1986; Janoff-Bulman, 1992; McCann & Pearlman, 1990; Joseph, Williams & Yule, 1997; Ehlers & Clark, 2000).

A separate body of the trauma literature has focused on people with serious mental illness (SMI) such as schizophrenia-spectrum disorders, bipolar disorders and treatment-refractory depression. For more than a decade, accumulating evidence has documented high prevalence rates of traumatic stress exposure and Post Traumatic Stress Disorder (PTSD) in people with SMI compared with the general population

(Mueser et al., 1998; Mueser, Rosenberg, Goodman, Trumbetta, 2002; O'Hare & Sherrer, 2009). These data suggest that SMI clients are a particularly high-risk group for trauma-related problems. Research suggests that PTSD can complicate the course and severity of SMI, especially in people with co-occurring substance abuse and SMI; adverse consequences may include marked impairment of social functioning and more frequent symptom relapses (Mueser, Rosenberg, Goodman, & Trumbetta, 2002). The following study hypothesized that appraisal—the manner in which an individual interprets an adverse event—is a key factor that may partially account for higher rates of PTSD in people diagnosed with major mood and schizophrenia-spectrum disorders, meriting special consideration for future research and development of specialized assessment protocols and clinical interventions for this population.

To date, very few studies have been conducted on trauma-related appraisal in people diagnosed with serious mental illnesses despite high prevalence rates of trauma exposure and PTSD in this population. The major purpose of this study was to examine the relationship between negative appraisal and symptoms of Posttraumatic Stress Disorder (PTSD) among adults diagnosed with serious mental illness (SMI). It was hypothesized that three specific types of trauma-related negative appraisals (i.e., about the self, about the world, and cognitions related to self-blame) would have a positive and significant association with traumatic stress symptoms while controlling for gender, total lifetime trauma, substance use, and symptoms of SMI (specifically, depression and psychosis). This study was conducted using secondary data drawn from a larger pilot study of 387 community clients diagnosed with major mood and schizophrenia spectrum disorders. Multiple linear regression was employed to analyze data from a sub-sample of clients (n = 291) who reported at least one traumatic event in his/her lifetime and

have an Axis I diagnosis of either a schizophrenia spectrum disorder or major mood disorder (i.e., uni-polar or bi-polar depression).

A second aim of the study was to compare negative appraisal and traumatic stress symptoms by gender. In the sub-sample, slightly more than half (n = 161 or 55.3%) of all reporting clients were female. It was hypothesized that females would report significantly more negative appraisal and experience higher rates of PTSD symptoms than males.

A third aim of the study was to examine the cumulative effect of multiple traumatic events on PTSD symptoms. It was hypothesized that higher rates of reported traumatic events would be positively and significantly associated with higher reported rates of PTSD symptoms. Lastly, this study evaluated the validity and reliability of abbreviated scales used to identify clients who might benefit from subsequent in-depth assessment and specialized treatment of traumatic stress symptoms that target maladaptive appraisals related to past traumatic events.

Findings from this study also may deepen our understanding of how individuals with SMI perceive the myriad stressful and traumatic experiences that all too often characterize their lives with the hopeful prospect of developing more effective treatment approaches with this vulnerable population.

Key Definitions

For purposes of this study, *serious mental illness* (SMI) was defined as a chronic and persistent Axis I disorder meeting criteria established by the Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR; American Psychiatric Association, 2000), but excluding primary substance use disorders. Such SMI conditions include schizophrenia-spectrum disorders, treatment-refractory major depression, and bipolar disorders.

This is consistent with the operational definition of SMI established by Public Law (P.L.) 102–321, the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) Reorganization Act, that created block grants for states to fund community mental health services for adults with SMI (definition of Adults with SMI published in the Federal Register May 20, 1993, Volume 58, No. 96).

Under federal guidelines, individuals with SMI must exhibit "serious impairment" defined as equivalent to a Global Assessment of Functioning (GAF) score of less than 60 (APA, 2000). Depending on individual characteristics of the specific disorder and the context of the social environment, there tends to be wide variability in onset, course, and severity of illness as well as degree of functional impairment. It is widely acknowledged that persons with SMI are a heterogeneous group, thus assessment and treatment must consider a number of factors beyond diagnosis and symptom severity (Rubin & Panzano, 2002) including access to social supports and community resources, capacity for vocational activity and independent functioning, and problems with alcohol or other drug use.

There is no single definition of *appraisal* employed in the literature, and the term often is used interchangeably with other monikers such as *cognitions* and *beliefs*. One of the most prominent definitions of *appraisal* was offered by influential stress researchers Lazarus and Folkman (1984): "the process of categorizing an encounter, and its various facets, with respect to its significance for well-being—not information processing per se, but more of a continuous, evaluative process focused on meaning and significance" (p. 31).

Traumatic stress as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) involves "direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that

involves death, injury, or a threat of the physical integrity of the person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member (APA, 2000, p. 463). Examples of traumatic events include military combat, physical and sexual assault, natural or man-made disasters, serious accidents, and life-threatening illnesses.

PTSD is defined as an anxiety disorder selectively manifested in individuals who have been exposed to extreme, life-threatening events, formally adopted as a clinical disorder in the *DSM-III* in 1980 (APA, 2000). The diagnostic criteria include: r*e-experiencing* (flashbacks, nightmares, intrusive thoughts and imagery, physiological reactivity to stimuli associated with the trauma); *avoidance* of stimuli associated with the traumatic event; and *increased physiological arousal* (such as sleep disturbance, hypervigilance, exaggerated startle response, irritability, impaired concentration). In addition, the intensity of the symptoms must cause functional impairment and be present for more than one month after exposure to the traumatic event (APA, 2000, pp. 463-472).

Trauma Exposure and PTSD in General Population Samples

Despite the avid attention paid to disorders such as PTSD, not all individuals who are exposed to a traumatic event experience long-term consequences. In fact, general population studies suggest that most individuals are capable of managing extreme stress without developing any disabling symptoms that impair functioning.

Epidemiological survey data have demonstrated that 60 to70% of persons in the U.S. have experienced at least one traumatic event in their lifetime with at least one life threatening incident such as an accident, sexual or physical assault, or exposure to a natural disaster (Kessler, Sonnega, Bromet, Hughes & Nelson, 1995; Resnick, Kilpatrick, Dansky et al., 1993). Lifetime

prevalence of PTSD in the U.S.population has been estimated to be about 8% with 10.4% occurring in women and 5.0% in men (Kessler et al., 1995). Estimates gleaned from the National Comorbidity Survey (Kessler, et al., 1995; Kessler, Chiu, Demler & Walters, 2005) suggest co-occurrence of PTSD with other forms of psychopathology (notably major depression, dysthymia, generalized anxiety disorder, substance use disorders) is exceptionally high; a lifetime history of at least one other mental disorder has been documented in 88.3% of men and 79% of women.

Across the globe, prevalence rates of trauma and PTSD tend to vary widely by country with higher reported rates in non-Western, economically-developing nations particularly those that have experienced political turmoil, terrorism, and war (de Jong et al. 2001; Keane, Marshall & Taft, 2006). For example, de Jong et al. (2001) established prevalence rates of current PTSD using the same assessment protocol in four post-conflict, low-income countries with randomly-selected citizens from Algeria (PTSD rate of 37.4%), Cambodia (28.4%), Gaza (17.8%), and Ethiopia (15.8%).

For reasons not fully explained by the extant literature, women appear to be more susceptible than men to developing PTSD (see recent reviews by Olff, Langeland, Draijer & Gersons, 2007; Tolin & Foa, 2008). Even when controlling for gender-linked exposure to specific types of events (combat versus sexual assault, for example, in which men are more likely to be exposed to combat and women are more likely to be sexually victimized) women are four times more likely than men to develop PTSD during their lifetimes (Olff et al., 2007). Olff and colleagues (2007) noted that women tend to exhibit greater frequency of specific risk factors that may account for higher PTSD rates, including trauma exposure at a younger age, greater exposure to specific types of trauma, markedly negative appraisals of threat and loss of control, a greater penchant for peri-traumatic dissociation, inadequate social support, and greater reliance

on alcohol to cope with trauma-related symptoms than men. In the aftermath of trauma, there is some evidence that women may be more prone to negative appraisal with a greater tendency to engage in more self-blame, to view themselves as incompetent or damaged, and more inclined to hold strong beliefs that the world is dangerous as noted by Tolin and Foa (2008). However, in studies on trauma and PTSD using clinical samples of clients with SMI, comparable rates of PTSD have been found in men and women (e.g. Mueser et al. 1998; O'Hare, Sherrer & Shen, 2006) although reported rates of PTSD in SMI are much higher than the general population overall.

People with SMI at High Risk for Trauma Exposure and PTSD

Recent studies with SMI individuals suggest strikingly higher rates of trauma exposure and PTSD than the general population with events such as sexual and physical abuse, rape, and physical assault not uncommon (Mueser et al., 2002; Cusack, Frueh, & Brady, 2004; Mueser et al., 1998; Resnick, Bond and Mueser, 2003; O'Hare & Sherrer, 2009) and sometimes occurring within the context of inpatient psychiatric hospitalizations (Frueh et al., 2005).

A history of psychopathology prior to trauma exposure was identified as a significant factor for PTSD in two meta-analytic studies (Ozer, Best, Lipsey & Weiss, 2003; Brewin, Andrews & Valentine, 2000) with effect sizes of $r = .11$ and $r = .17$ respectively. A range of studies suggest that persons with SMI have greater vulnerability to the effects of stressful and traumatic events often leading to increased emotional distress, exacerbation of psychiatric symptoms, poorer treatment outcomes, and increased risks for additional trauma (Resnick et al. 2003; Mueser et al., 2002; Goodman, Rosenberg, Mueser & Drake, 1997).

In clinical studies of SMI individuals, reported lifetime rates of physical and sexual abuse and other interpersonal violence range from one-third to 97% of clients (Resnick et al. 2003;

Mueser et al. 1998; 2002). Women with SMI appear to be especially vulnerable to interpersonal violence throughout their lives with higher than average prevalence rates of childhood physical and sexual abuse (Davies-Netzley, Hurlburt, & Hough, 1996; Goodman, Rosenberg, Mueser and Drake, 1997) and victimization in adulthood (Goodman, Salyers, Mueser, Rosenberg, Swartz, Essock et al. 2001; Goodman et al. 1997; Mueser et al. 1998; Resnick, Bond & Mueser, 2003).

Rates of PTSD in a number of clinical studies on SMI clients have been estimated at 29% to 43% (Mueser, Rosenberg, Goodman & Trumbetta, 2002; Mueser, Trumbetta, Rosenberg, Vidaver, Goodman, Osher & Auciello 1998; Resnick, Bond, & Mueser, 2003; O'Hare, Sherrer & Shen, 2006). In one study of severely mentally ill inpatients and outpatients, Mueser et al. (1998) demonstrated that 43% of them met the criteria for PTSD and rates of PTSD were shown to be comparable for men and women. Types of traumatic exposure, however, differed for males and females. Women were more likely to have experienced physical and sexual assault, and having witnessed another being killed or injured. Males were more likely to have witnessed a close friend or relative being murdered or killed by a drunk driver. These investigators also reported high rates of PTSD among clients with depression (58%), borderline personality disorder (54%), and schizophrenia (28%).

In a survey of 257 community mental health clients with SMI (O'Hare, Sherrer, & Shen, 2006), slightly over one-third met the PSS-I diagnostic criteria for PTSD, a rate that compares to other published estimates (see Mueser et al. 2002; Mueser, Rosenberg, Jankowski, Hamblen & Descamps, 2004). In addition, rates of PTSD were comparable for female and male clients as has been previously reported (Mueser et al. 1998). Rates of PTSD among persons diagnosed with major mood disorders were more than twice as high as in those diagnosed with schizophrenia

spectrum disorder, and these rates and proportional differences by diagnostic category were also comparable to previous published data (e.g., Mueser et al. 1998).

A persistent cultural stigma that views individuals with mental illness as dangerous or otherwise socially aberrant may also contribute to a sense of powerlessness and increased life stress for people with SMI (Corrigan, 2004) perhaps conferring greater vulnerability to negative effects from traumatic stress.

A limited number of studies have linked trauma exposure and psychosis in individuals diagnosed with schizophrenia-spectrum disorders (Calvert, Larkin & Jellicoe-Jones, 2008; Kilcommons & Morrison, 2005). Researchers exploring the relationship between trauma and psychosis are concerned with whether trauma exposure may lead to PTSD in some individuals, and, conversely, to what extent trauma and PTSD may exacerbate the symptoms of schizophrenia with recent theoretical models focused on elucidating this relationship (Read, Perry, Moskowitz & Connolly, 2001; Morrison, Frame & Larkin, 2003). In considering this potential association, it also may be critical to consider the varying interpretations and appraisals of the experience of psychosis (e.g. perceived threats to personal safety stemming from paranoid beliefs or regarding the self as permanently damaged from a psychotic episode).

Theoretical models addressing the interplay of traumatic stress and SMI are beginning to emerge along with some empirical support. Grounded in the stress-vulnerability model of schizophrenia, Mueser, Rosenberg, Goodman and Trumbetta (2002) have offered a working model whereby PTSD mediates both past and current traumatic events and increased severity leading to poorer outcomes in persons with severe mental illnesses. The effects of PTSD symptoms (i.e., avoidance, hyperarousal and re-experiencing) are hypothesized to have both a direct impact on symptoms and course of treatment as well as indirect effects via substance

abuse, re-traumatization, social supports, and coping, including appraisal / reappraisal and emotion regulation.

In sum, a compelling body of empirical literature has documented the impact of trauma exposure in SMI clients with notably higher rates of PTSD than found in the general population. Research suggests that PTSD can complicate the course and severity of SMI, especially in people with co-occurring substance abuse and SMI; adverse consequences may include marked impairment of social functioning and more frequent symptom relapses.

Policy, Practice and Research Implications of Present Study

This study makes a potentially significant contribution to the empirical literature by examining the hypothesized effects of traumatic stress on clients with SMI, specifically, whether negative appraisal of past traumatic events significantly accounts for unique variance in PTSD symptoms when controlling symptoms of major mental illness, specifically depression and psychosis, and alcohol / other drug use. Based on a comprehensive and systematic review of the literature (summarized in Chapter 3 and *Table 2*), this research constitutes one of the largest studies of negative appraisal in trauma-exposed community clients with SMI to date. As such, this study could significantly contribute to the knowledge base regarding trauma in people with SMI, and offer valuable recommendations for improving assessment procedures that better inform treatment decisions.

Social workers who serve populations diagnosed with SMI in forensic, inpatient, and community settings often are in key positions to undertake a comprehensive trauma history including assessment for PTSD and negative appraisals that may be tied to emotional distress. As suggested by the model posited by Mueser et al. (2002), the potentially deleterious effects of traumatic stress and PTSD may exacerbate psychiatric symptoms and interfere with overall

functioning and quality of life. Additional research is needed to better understand how negative appraisals may worsen common psychiatric symptoms of SMI such as psychosis and depression. Research in this area also may inform the development of more specialized treatment protocols. For example, two treatment studies that will be examined in more detail in Chapter 3 (Mueser et al., 2007, 2008), indicate the potential for modifying maladaptive appraisals using a specialized cognitive restructuring approach adapted for SMI clients. Examining underlying trauma-related appraisals about external events and encouraging the formulation of more realistic judgments to replace distorted beliefs may be beneficial in reducing emotional distress that contribute to PTSD symptoms.

♦♦♦

CHAPTER TWO

Theoretical Foundation

"I conclude that there are two main contrasting ways an appraisal can come about. First the process of appraising can be deliberate and largely conscious. Second, it can be intuitive, automatic and unconscious."

-Richard S. Lazarus (1999)

This chapter will address cognitive appraisal as a key construct in contemporary models of PTSD that form the theoretical basis for this research study. At the outset, however, it is important to note how appraisal is understood in a broader context of emotion generation and how this can be related to stress-coping responses, including posttraumatic adaptation. The first section of this chapter will discuss briefly how appraisal evolved as a cognitive construct in theories of emotion.

Role of Appraisal in Theories of Emotion

Appraisal has been a construct of interest among emotion and stress researchers for several decades (e.g. Arnold, 1960, Lazarus & Folkman, 1984; Scherer, 2001). Broadly speaking, appraisal can be viewed as a cognitive component of emotion generation. *Experienced emotion* can be construed as a complex system encompassing a variety of psychological and neurobiological processes situated within a given social context. As Russell and Barrett (2009) contend:

> Emotions have been defined as brain states, bodily states, behaviors, feelings, cognitions, social roles, cultural practices, or any combination of the above. Some scholars believe that emotions are what make us human. Others believe that emotions are vestiges that interfere with our rational thought. Others believe that emotions are what link us to our animal cousins. Still others say that emotions link us to our immediate surroundings and cultural heritage. For humans to understand their place in the world, we need to understand the nature of emotion.

While there are divergent viewpoints on the nature of emotion, there is general agreement that emotion is comprised of three overlapping components: *behavior* (e.g. freeze, escape,

attack); *cognition* (processes involving interpretation and meaning such as appraisals and attributions); and *physiology* (involving various aspects of brain functioning, including neuroendocrine responses associated with "fight or flight" responses).

From an evolutionary standpoint, emotions are considered essential to our survival. Fear, for example, may help us recognize and respond to danger while love is associated with social intimacy and connectedness. In concert with or contrary to rationality and reason, emotions guide our interactions with the world. Functional models posit that emotions arise from evaluations or appraisals of situations and events (Barrett, Mesquita, Ochsner & Gross, 2007) with an evaluative component seen as a necessary antecedent for eliciting negative emotions such as sadness, anger, fear, guilt or so-called positive emotions such as happiness, relief, hope, pride, or love.

One point of debate among emotion researchers is whether cognitions that allow for appraisals always precede emotion (for a comprehensive discussion of prominent emotion theories and research, see Power & Dalgleish, 2008; and Barrett, et al. 2007). However, it has been established that there is more than one pathway to emotion generation. For example, one "shortcut" involves direct connection with sight to allow quick processing of potentially dangerous stimuli bypassing the higher order cognitive processes (Power & Dalgleish, 2008). Hence, emotions can be protective in helping us to recognize and respond to potential threats, including traumatic events. A fundamental question posed by Scherer (2001, pg. 370) can be related to how an individual initially appraises a traumatic event and the extent to which emotional arousal follows: *How much do the consequences of this event affect major goals or values of the organism, and how much adaptive action or internal adjustment does this require?*

Theorists have posed a variety of questions about the psychological and physiological processes responsible for generation and regulation of emotion (Roseman & Smith, 2001). For example, how do we account for different emotional responses to the same event? What initiates the process of emotional response? How do individuals attempt to regulate their emotions? What underlying processes contribute to emotion dysregulation? What social and cultural factors influence appraisal and emotion? What aspects of maladaptive appraisal and emotion can be modified by specific treatment interventions?

Magda Arnold (1960), regarded as the founder of modern appraisal theory, considered appraisal to be an "intuitive" process of the 'here and now' aspects of situations and events, not a rational and deliberate process."

A more contemporary view of the appraisal process is offered by Scherer (2001, pg. 369):

> The organism constantly processes *information* about events (external stimulation and changes in its internal milieu). The result of this processing, *knowledge* in the widest sense, is stored in short-term memory. The organism constantly *evaluates* all this information (or the knowledge about the facts that it represents) with respect to its implications for well being. This evaluation or *appraisal process* consists of determining the overall *significance* of the stimulus event for the organism (characterized by its position on several *dimensions* concerning the consequences of the event in relation to needs, motives, and values of the organism). The result of this appraisal process—the appraisal *outcome*—produces emotion episodes when there is sufficient evidence that the perceived significance of the appraised event requires adaptive action or internal adjustment.

Lazarus (1999, 2001) maintained that human beings process (and hence appraise) information outside of conscious awareness which in turn evokes discrete emotional states. Lazarus also distinguished action from outcome with regard to appraisal, noting that the verb "appraising" is the act of making a particular evaluation while the noun form "appraisal" can be seen as the product or outcome of the evaluation (2001, pg. 42).

Common assumptions of appraisal theory are articulated by Roseman & Smith (2001, pp. 6-10):

1. *Emotions are differentiated by appraisals.*
2. *Differences in appraisal can account for individual and temporal differences in emotional response.*
3. *All situations to which the same appraisal pattern will evoke the same emotion.*
4. *Appraisals precede and elicit emotions.*
5. *The appraisal process makes it likely that emotions will be appropriate responses to the situations in which they occur.*
6. *Conflicting, involuntary, or inappropriate appraisal may account for irrational aspects of emotions.*
7. *Changes in appraisal may account for developmentally and clinically induced changes in emotion.*

Of particular relevance for people with SMI is the assertion that distorted, involuntary or otherwise inappropriate appraisals (assumption number six) may give rise to distressing or irrational emotions that may be difficult to regulate given the inherent vulnerabilities associated with major mood and schizophrenia-spectrum disorders. However, as proposed by assumption seven, *changes* in appraisal—whether induced by developmental maturation or occurring within a treatment context—may facilitate corresponding changes in emotional states.

The idea that maladaptive appraisal patterns are linked to distressing emotions informed the work of Aaron Beck (1976) who developed the "cognitive triad" model of depression. In Beck's cognitive model, individuals were more prone to depression if they maintained negative beliefs about themselves, the world, and the future. Since the 1970's, Beck's approach to cognitive therapy has been extended to other problems and disorders including PTSD and other anxiety disorders. The basic tenets of cognitive therapy—an examination of underlying appraisals that individuals hold about external events that includes the formulation of more

realistic judgments to replace distorted beliefs—has garnered considerable empirical support in reducing subjective distress across a range of emotion-based disorders (Salkovskis, 1997).

Influenced by personality traits and cognitive schemes formulated through various developmental experiences, appraisal cognitions are theorized to occur in two different forms: *automatic thoughts* (e.g. Beck, 1976) that may be out of conscious awareness, or a more deliberate process that Joseph, Williams and Yule (1997) distinguish as "conscious thinking through of alternative meanings, influenced by disclosure to others in the social network" (p. 83). As suggested by Lazarus (1999) both individual differences and social context are instrumental in determining how a person regards his or her current circumstances: "Appraisals are commonly based on many subtle cues in the environment, what has been learned from previous experience, and a host of personality variables, such as goals, situational intentions, and personal resources and liabilities" (p. 81).

Appraisal also can be tied to variability in stress-coping responses. In their influential model of stress and coping, Lazarus and Folkman (1984) made a distinction between *primary appraisal* and *secondary appraisal* with each playing a different role in determining individual stress reactions both immediate and long-term. *Primary appraisal* involves the perception and initial determination of potential threat—is the stimulus encountered irrelevant, benign-positive or stressful? If the stimulus encountered is considered stressful, an evaluation of potential harm/loss, threat, or challenge will transpire.

In *secondary appraisal*, individuals consider their coping options for managing a stressful event or situation (p. 35): "When we are in jeopardy, whether it be a threat or a challenge, something must be done to manage the situation. In that case, a further form of appraisal becomes salient, that of evaluating what might and can be done, which we call secondary

appraisal. Secondary appraisal activity is a crucial feature of every stressful encounter because the outcome depends on what, if anything, can be done, as well as what is at stake."

Lazarus and Folkman (1984) further noted, "Secondary appraisals of coping options and primary appraisals of what is at stake interact with each other in shaping the degree of stress and the strength and quality (or content) of the emotional reaction." Secondary appraisal can be related to Bandura's (1982) concept of self-efficacy in that an individual's beliefs in his or her capabilities to cope with a given situation may directly influence the individual's appraisal, (e.g. interpreting a perceived threat as manageable or overwhelming).

Cognitive Appraisal of Traumatic Events

When an individual confronts a traumatic stressor, the process of appraisal is crucial to interpreting the experience with a corresponding intensity of emotional arousal which in turn guides the selection of coping strategies to aid in adaptation. However, appraisal is not exclusively an internal psychological process given that meaning elements are often constructed and modified within a given social and cultural context. Moreover, appraisals and subsequent coping responses have been found to influence neuroendocrine responses to extreme stress (for a review, see Olff, Langeland & Gersons, 2005); this body of empirical literature illustrates the dynamic interplay of psychological and physiological processes in human adaptation to trauma.

Intense emotional responses such as fear, horror, panic, helplessness, shame, and guilt have been implicated in PTSD. In a meta-analytic study of PTSD risk factors, Ozer et al. (2003) examined the relationship between peri-traumatic emotional reactions and PTSD and found a similar effect size across five studies (r =0.26) all based on retrospective self-reports by study participants. Similarly, behavior during the event—freezing, fleeing, not coming to the aid of others, not fighting back—can provoke negative appraisals in the aftermath of a traumatic which,

in turn, may produce posttraumatic guilt, shame, and self-blame as noted by a number of researchers (Resick, 2001; Wilson, Drozdek & Turkovic, 2006).

Hence, in the aftermath of trauma exposure, appraisal is linked to particular emotions and emotion regulation with distinct simultaneous physiological correlates, serving as both a risk and protective factor, and instrumental in coping selection, including the perception and utilization of social support.

Negative Appraisal in Cognitive Theories of PTSD

Theories focusing on trauma and PTSD attempt to explain why some individuals who experience traumatic events or extreme psychological stress develop severe adverse reactions while others appear to transcend these extreme events with few, if any, long-lasting negative effects. A well-developed theory must account for individual differences both short and long term, including so-called normal or positive adaptation as well as a potential range of adverse consequences—varying in intensity and chronicity—including depression, substance abuse disorders, and PTSD. In addition, a valid theory of traumatic stress adaptation must account for each of the three primary symptom clusters of PTSD: *reexperiencing; avoidance;* and *hyperarousal*.

Cognitive theories of PTSD assume that it is the *interpretation*, rather than the traumatic event itself that causes disruption in mood and behavior with each distinct emotional state fueled or maintained by corresponding thoughts. Managing the effects of traumatic stress demands processing of new, often overwhelming, information that is subject to appraisal and reappraisal. Early social-cognitive theories attempted to explain post-traumatic reactions by taking into account mediating cognitive “attributions” or “schemas” that differentially influence adaptation to stress and coping (Horowitz, 1986; Janoff-Bulman, 1992; McCann & Pearlman, 1990). Such

theories considered how trauma disrupts or challenges pre-existing mental representations of the self and the world, forcing the person to reconcile incompatible information stemming from the trauma. Information processing theories focused on memory structures, including the encoding, storage, and retrieval of trauma-related stimuli. Memory representations of the traumatic event(s) were considered crucial to the initial appraisal of an event as well as for reappraisal post-trauma.

According to some theorists, appraisal occurs in levels or "cycles" with each cycle leading an event or situation to be appraised in a more nuanced or complex way (Powers & Dalgleish 2008, p. 150). While appraisals tend to shift and evolve over time, it's conceivable that a person may get "stuck" in a particular appraisal of a traumatic situation or event that produces ongoing emotional distress especially if the person feels overwhelmed and unable to mobilize sufficient resources to cope effectively. An important point to consider is that emotions commonly associated with trauma exposure—for example, sadness, anger, guilt, shame, and fear—may themselves become the target of appraisals, often prompting attempts to regulate emotional distress through reappraisal or thought suppression.

In cognitive models of trauma and PTSD, adaptation involves both conscious and unconscious mental processes that influence appraisals. Appraisals may become thematically fixed or are constantly evolving, influenced by social context and physiological arousal. Appraisal processes are seen as mediating the relationship between trauma and negative outcomes such as PTSD (Ehlers & Clark, 2000). Most cognitive models of posttraumatic stress adaptation consider the incongruities between trauma-related information (information processing and memory structures) and pre-existing mental representations such as schemas. Appraisals and reappraisals of this trauma-related information (drawing on autobiographical

memory) and the incongruities (e.g. if I am a strong person, why didn't I fight back?) are presumably linked to distressing emotions such as anger, sadness, and guilt. (See *Table 1* below.)

TABLE 1. Appraisal and Emotions

Negative emotion	***Appraisal dimensions / Cognitive themes***
Sadness	Loss, grief, failure to achieve a significant goal
Anger	Perceived unfairness; blocking or frustration of significant goal
Guilt	Failure to live up to a personal moral standard or responsibility
Shame	Having disgraced or dishonored oneself; losing face in the eyes of others
Fear	Perceived threat to physical, psychological, or social well being
Disgust	A strong association (e.g. with a person, object, action) that prompts revulsion

Arguably, contemporary cognitive models are among the most highly developed and appear to have greater explanatory power than psychoanalytic and learning theories (for comprehensive reviews, see Dalgleish, 2004; and Brewin & Holmes, 2003). With primary emphasis on unconscious conflicts that are not readily accessible to the individual, psychoanalytic theories have been criticized as lacking in empirical support, with the major constructs (the id, the ego, and the superego, for example) impossible to observe or measure. However, Freud's groundbreaking work put forth the ideas of hysteria and neurosis, and he attempted to explain these conditions by looking for clues in traumatic experiences occurring in childhood. Certainly, this has relevance when one considers the common sequelae associated with childhood sexual abuse.

At the other end of the continuum, learning theorists focused exclusively on observable behavior with a basic assumption that learning is shaped through conditioning and reinforcement of punishment and reward. Mowrer (1960) expanded upon classical conditioning to account for

avoidance behavior that was commonly observed, presumably as a response to conditioned fear. Mowrer's *two-factor theory* added the principle of *operant learning* to classical conditioning. In applying *two-factor theory* to trauma, an individual first develops a conditioned fear response through classical conditioning, and, second, then learns to reduce the anxiety associated with traumatic stress through avoidance of stimuli that evoke the conditioned fear response (referred to as *operant learning through negative reinforcement*). Continued avoidance, in turn, reinforces future fear responses to the stimulus.

With respect to the complex biological, psychological, behavioral, and social aspects of post-trauma experiences, learning theory lacks full explanatory power to account for highly variable individual reactions. With its primary focus on observable (and hence measurable and testable) behavior, a major criticism of applying learning theory to traumatic stress is that classical conditioning and operant learning cannot fully account for the reexperiencing symptoms of flashbacks, nightmares, and intrusive imagery (Foa & Rothbaum, 1998; McCann & Pearlman, 1990). Although there is considerable empirical support for learning theory in a number of problem domains, including anxiety disorders, it is considered to be too parsimonious in explaining adaptation traumatic stress (Foa & Rothbaum, 1998; Joseph, Williams & Yule, 1997).

On the other hand, cognitive theories of PTSD take into account the myriad ways in which humans mentally process, appraise, interpret, and assign meaning to traumatic experiences (Dalgleish, 2004; Ehlers & Clark, 2006). In recent years, a number of studies have demonstrated that negative appraisals of past traumatic events that become fixed and distorted appear to create a sense of ongoing threat that tends to be associated with persistent PTSD symptoms (e.g. Dunmore, Clark & Ehlers, 2001; Bryant, 2003; McNally, 2003).

Two prominent cognitive theories of PTSD that have garnered considerable empirical support are Emotional Processing Theory or EPT (Foa & Kozak, 1986; Foa & Riggs, 1993; Foa & Rothbaum, 1998; Foa, Huppert & Cahill, 2006) and a model proposed by Ehlers and Clark (2000). As posited by Foa and Kozak (1986), a 'fear network' is established in memory during trauma exposure. This 'fear network' includes stimulus information about the trauma, interpretations of cognitive, behavioral, and physiological reactions, and information linking these stimulus and response elements. Post-traumatically, an individual will draw upon the information in an attempt to process or integrate the experience into existing schemata or pre-trauma worldview. In a further elaboration of EPT, Foa and her colleagues (Foa & Rothbaum, 1998; Foa, Huppert & Cahill, 2006) contend that traumatic memories are encoded in a fragmented manner that impedes successful processing of information. In the updated version, there is greater emphasis on pre, peri and post-trauma beliefs with more rigid beliefs—positive and negative—associated with a greater likelihood of PTSD. Foa also placed more focus on negative appraisals of trauma-related stimuli, including the person's emotional and behavioral responses to the trauma, symptoms that developed in the aftermath, and the perceived reactions from those in the social network.

Associated with an impressive body of work spanning more than 20 years, EPT has considerable explanatory power in its comprehensive examination of the processes underlying pathological responses to traumatic stress (summarized by Brewin & Holmes, 2003; Dalgleish, 2004). A clinical application of EPT that has garnered considerable empirical support is prolonged exposure (PE) therapy for PTSD (Foa & Rothbaum, 1998). With PE, repeated reliving of the trauma is proposed to facilitate habituation and a more integrated and coherent trauma narrative (Foa et al., 2006).

To underscore the importance of appraisal in the process of reacting to traumatic stimuli, Foa, with her colleagues Ehlers, Clark, Tolin and Orsillo (1999) developed what has become one of the most widely-used measures of trauma-related thoughts and beliefs, the Posttraumatic Cognitions Inventory (PTCI). The PTCI is a 36-item self-report scale that assesses cognitions about oneself (e.g. "I have been permanently changed for the worse"), the world (e.g. "You can never know who will harm you"), and self-blame (e.g. "The event happened because of the way I acted") using a 7-point Likert scale with response options ranging from 1 ("totally disagree") to 7 ("totally agree"). Higher scores on the PTCI suggest greater endorsement of negative beliefs associated with a traumatic event(s).

Another notable cognitive model of PTSD was proposed by Ehlers and Clark (2000) who built upon the influential cognitive theory of Beck (1976). Ehlers and Clark contend that PTSD develops and is maintained by excessively negative appraisals of ongoing, current threat that persist long after the traumatic event has transpired. In PTSD, negative appraisals become intrusive and lead to a vicious cycle of conscious avoidance or cognitive suppression of trauma-related thoughts and emotions that may increase cognitive intrusions about the trauma thereby exacerbating emotional distress. According to Ehlers and Clark, ruminations become maladaptive if a person becomes "stuck" in a distorted pattern of thinking that ultimately impedes recovery and impairs functioning.

Posttraumatic introspection may provoke negative beliefs about the self and the world (Ehlers & Clark, 2000; Foa, Huppert & Cahill, 2006).Drawing from autobiographical memory, appraisals and reappraisals of trauma-related information and the incongruities (e.g. if I was attacked it must mean I did something to deserve it) are presumably linked to distressing emotions such as anger, sadness, and guilt that become pathological. Ehlers and Clark's model

has generated a significant body of research with both cross-sectional and prospective studies supporting the basic theoretical tenets (summarized by Brewin & Holmes, 2003; and Dalgleish, 2004).

Bolstering the evidence are prospective studies documenting acute stress reactions suggesting that catastrophic appraisals in the immediate aftermath of trauma may be strongly predictive of later psychopathology such as PTSD (Bryant, 2003; McNally, 2003). Furthermore, there is some evidence that women may be more prone to negative appraisal with a greater tendency to engage in more self-blame, to view themselves as incompetent or damaged, and more inclined to hold strong beliefs that the world is dangerous as noted by Tolin and Foa (2008).

A range of well-designed longitudinal and cross-sectional studies examining the effects of trauma across varying populations have consistently noted the relationship between negative appraisals and PTSD symptoms. Recent prospective studies include trainee firefighters (Bryant and Guthrie, 2005, 2007), victims of crime including physical and sexual assault (Dunmore, Clark & Ehlers,2001; Halligan, Michael, Clark & Ehlers, 2003; Mueller, Moergeli & Maercker, 2008), and people who have suffered serious injury, including motor vehicle accident survivors (Mayou, Ehlers & Bryant, 2002; O'Donnell, Elliott, Wolfgang & Creamer, 2007).

Notable retrospective studies include Vietnam veterans (Dohrenwend, Neria, Turner, Turse, et al. 2004), UK armed forces personnel deployed in the initial phases of the Iraq War (Iversen, Fear, Ehlers et al., 2008), Israeli ex-prisoners of the 1973 Yom Kippur War (Solomon & Dekel, 2005), Sri Lankan tsunami survivors (Lommen, Sanders, Buck & Arntz, 2009) and people with spinal cord injuries (Agar, Kennedy & King, 2006). In short, maladaptive appraisals

may be correlated with more adverse reactions in the aftermath of trauma, and thus may be a critical target for early intervention.

Appraisal in social context

Appraisals and emotions are not strictly private processes—they tend to be socially-shared phenomena, and this interaction has implications on both an individual as well as a group level (for a review on the social sharing of emotion, see Rime, 2009). In the aftermath of trauma, feedback—both negative and positive—from one's social network presents an individual with an opportunity to reappraise his or her circumstances. The availability and utilization of social support have been demonstrated in a number of studies to be a protective factor in post-trauma adaptation (see Guay, Billette & Marchand, 2006, for a recent review on social support and PTSD.)

Beyond the immediate social network, appraisal also may be understood within a larger cultural context. For example, Mesquita and Ellsworth (2001) describe a cross-cultural model of appraisal proposing a hypothesis of *universal contingencies*: "if people from different cultures appraise a situation in the same way, they will experience the same emotion. If they experience a different emotion, it is because they appraised the situation differently, and appraisal theories allow us to specify (at least roughly) what this difference is appraisal is likely to be. What is universal is the link between appraisal patterns and emotions—the if-then contingency" (p. 233). According to this model, systematic cultural differences in the appraisal of "the same" events may evoke dramatically different emotions and "are assumed to be similar only to the extent that they are characterized by similar patterns of appraisal, therefore the appraisal-emotion association is hypothesized to be universal, rather than either emotions or emotion antecedents."

This idea can be extended to traumatic events that occur in different cultural contexts where appraisals may be influenced by varying social norms, customs, religious beliefs, and structures of governance. On a global scale, for example, there is ongoing debate that Western notions about PTSD often presume a universal response—and similar appraisals—of adverse events such as war, genocide, torture, and natural disasters. Critics have expressed concern about the potential for trauma researchers to superimpose Western standards of trauma and PTSD on groups which do not conform to the medical model of DSM and ICD criteria, arguing such approaches are largely untested and may not be cross-culturally valid (Kienzler, 2008). Recently, the Inter-Agency Standing Committee (IASC, 2007) in cooperation with the United Nations (UN) and the World Health Organization (WHO) released comprehensive practice guidelines on psychosocial interventions utilized as part of humanitarian relief efforts worldwide. Although the IASC guidelines acknowledge the diversity of differential reactions to extreme stress and urge caution in placing a disproportionate focus on PTSD over other physical and psychological needs, there are differing opinions as to whether the guidelines go far enough in encouraging culturally competent service provision to minimize the risk of unintended harm to vulnerable populations (Abramowitz & Kleinman, 2008).

Appraisal and post-trauma coping

How an individual constructs meaning in the aftermath of trauma may be seen as one form of *cognitive coping*—the manner in which a person thinks about the event after it occurs. People tend to utilize different styles of coping in response to stress, and strategies may vary widely by the type of stressor encountered. Coping styles also tend to be influenced by a variety of individual factors, including age, personality, temperament, previous experience, and social

context. Lazarus and Folkman (1984) distinguished between "emotion-focused" and "problem-focused" coping with the former referring to efforts to regulate affect.

Given the role of cognition in emotion generation, appraisal and reappraisal are important aspects of emotion regulation, defined by Gross (2002) as the "processes by which we influence which emotions we have, when we have them, and how we experience and express them." A review by Gross (2002) presents data from a set of interrelated experimental and cross-sectional studies testing his conceptual model of emotional regulation (Gross, 1998) comparing two strategies for (antecedent focused) emotional regulation—reappraisal and emotional suppression to determine if one strategy was more efficacious (e.g. fewer consequences such as decrease of emotional experience, memory impairment) than the other in terms of cost and benefits.

As compared with emotional suppression, cognitive reappraisal was found to be more effective strategy in regulating emotions with fewer consequences, allowing for fuller experience of positive and negative emotions overall while decreasing negative emotions. In general, reappraisal decreased negative emotion experience without dampening overall emotional expression and experience of positive emotions. Thus, emotion suppression may have deleterious consequences with trauma exposure (Gross, 2002) with similar findings by other investigators that efforts to suppress thoughts and images may exacerbate symptoms (Beck, Gudmundsdottir, Palyo, Miller & Grant, 2006). However, as Gross notes, reappraisal may not always be a preferable coping strategy as there may be instances in which it is difficult for an individual to reappraise when emotion suppression is the only practical option. Further, it may be maladaptive to change one's view of a given situation if it compromises important goals or safety.

Potential significance of trauma-related appraisals in people with SMI

Research advances on emotion regulation have direct relevance for clinical work given that a significant number of DSM Axis I and all the Axis II diagnoses—including PTSD—have some element of emotional dysregulation at the core (Power & Dalgleish, 2008; Barlow, Allen & Choate, 2004; Gross, 2002). Such "disordered emotions" are critical targets for treatment interventions including those designed to modify antecedent appraisals linked to distressing emotional states characteristic of mood and anxiety disorders (Barlow, Allen & Choate, 2004; Moses & Barlow, 2006).

As noted in Chapter 1, people with SMI and co-occurring PTSD tend to experience more severe symptom relapses, require more frequent psychiatric hospitalizations, and tend to have poorer functioning overall (Mueser, Essock, Haines, Wolfe & Xie, 2004). How might a pre-existing SMI such as major depression, bipolar disorder, or schizophrenia influence the appraisal of traumatic events? Is there a unique and significant relationship between negative appraisal and PTSD even when controlling for the common symptoms associated with different forms of severe mental illness?

As will be seen in Chapter 3, only a small number of studies have examined the relationship between trauma-related appraisals and PTSD symptoms in people with SMI.

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CHAPTER THREE

Literature Review

"People only see what they are prepared to see."
-Ralph Waldo Emerson

Search Procedure and Inclusion Criteria for Review

To identify studies that examined appraisal of traumatic events among people with SMI, a systematic review of the literature was conducted using the following databases: PsycINFO; PILOTS (Published International Literature on Traumatic Stress); ASSIA; and PubMed, supplemented with hand searching of all articles. Key word terms included *trauma*; *posttraumatic stress; PTSD; cognitive appraisal; cognitions; attributions; schema; beliefs; serious mental illness; mood disorders; major depression, bipolar disorder;* and *schizophrenia*. Systematic searching yielded 88 empirical studies with only 9 studies meeting the following inclusionary criteria: 1) exposure to at least one traumatic event as defined by DSM criteria for Acute and Posttraumatic Stress Disorders or other valid criteria; 2) a diagnosis of a preexisting serious mental illness (schizophrenia, bipolar disorder, major depression) using DSM, ICD-10 or other valid measure of psychopathology; 3) a valid measure of posttraumatic stress symptoms or subjective distress; and 4) a measure of appraisal or similar cognitive construct denoting an evaluative judgment of a process or outcome (e.g. 'beliefs' 'attributions,' 'cognitions') pertaining to a specific traumatic event(s) endorsed by study participants.

Studies of Appraisal and Trauma among Individuals with SMI

In this section, nine core studies examining appraisal processes in trauma-exposed SMI clients will be analyzed (see *Table 2).* These studies also were summarized in a recent critical review by Sherrer (in press).

Jackson, Knott, Skeate, and Birchwood (2004) examined the role of cognitive mediation in first-episode psychosis (FEP) in a convenience sample of 35 community clients, arguing that a FEP can be a highly traumatic experience that may lead to PTSD symptoms although DSM criterion A1 may not be met. They tested the link between "candidate traumas" associated with FEP (e.g., the experience of psychosis, police involvement, involuntary hospitalization, and stressful experiences inpatient) and the presence of PTSD symptoms. The researchers sought to establish whether trauma-related symptoms associated with FEP are mediated by coping style and appraisals of trauma severity. Clients were interviewed approximately 18 months post-FEP. Clients who appraised their hospitalizations as particularly stressful were more likely to meet criteria for PTSD. Findings suggest that individual appraisals were more predictive of PTSD than objective events such as involuntary treatment. In particular, perceived stressfulness of time spent inpatient correlated specifically with intrusive memories about the FEP ($r = 0.61$; $p = 0.002$); this correlation remained significant even after controlling for time elapsed since first episode ($r = 0.64$; $p = 0.001$). Notable limitations include a small, non-random sample with no clear exclusionary criteria, making it difficult to ascertain whether refusers had more severe symptoms.

Lommen & Restifo (2009) conducted a cross-sectional survey in the Netherlands recruiting 33 outpatient clients with diagnoses of schizophrenia and schizoaffective disorder to determine if use of self-report measures would yield higher rates of traumatic events and PTSD

diagnoses when compared with chart reviews. Investigators also hypothesized that negative trauma-related cognitions as measured by the PTCI would be related to PTSD symptom severity. The index traumas were identified by the study participants with the sudden and unexpected death of a loved one cited as the most common (n=23, 69.7%).

Among the study participants, 97% reported at least one lifetime traumatic event with 81.8% reporting at least two and 60.6% at least three. Two different scoring rules were utilized in calculating PTSD diagnoses, one yielding a more conservative estimate of 9.1% (21.2% excluding the need to fulfill Criteria A1) and the other yielding 39.4% (18.2% without Criteria A). Negative cognitions about self, world, and self-blame were significantly and positively related to PTSD symptom severity. However, the total PTCI scores had a stronger association with PTSD symptom severity as compared with scores of individual sub-scales (r = .74, P < .001). A notable finding was that none of the study participants had a PTSD diagnosis in the medical record. Limitations include small sample size, potential sampling bias with the possibility that refusers had higher rates of trauma and PTSD, reliance on chart diagnosis as opposed to structured clinical interview, and use of self-report measures.

Kilcommons and Morrison (2005) tested the hypothesis that psychosis may be linked to negative and persistent beliefs about the self and the world in the aftermath of trauma using self-report data from 32 people (25 males, 72%) diagnosed with various schizophrenia-spectrum disorders. Findings suggested that hallucinations positively correlated with negative cognitions about the self and the world, amnesic dissociation and depersonalization. However, self-blame was not correlated with hallucinations. Negative cognitions about the self and the world were positively and significantly correlated with hallucinations (0.52, significant at 0.01 level and 0.39, significant at the 0.05 level respectively) but not delusions (0.22, NS). However,

dissociation seemed to be more strongly associated with hallucinations than negative trauma-related cognitions. Use of t-tests as opposed to Mann Whitney to compare gender differences should be noted as a study limitation given the total sample size (n = 35) and the small number of female participants (n = 7). Despite the limitations of the small sample and reliance on self-report measures, these findings warrant further examination of whether negative appraisals resulting from trauma might increase vulnerability to psychosis.

In a similar vein, Chisholm, Freeman, and Cooke (2006) investigated the potential predictors of PTSD symptoms in response to a psychotic episode in a sample of 36 adults (21 males) diagnosed with schizophrenia or related disorders of non-affective functional psychosis. All the study participants had experienced delusions during a recent hospital admission with 19 reporting persecutory delusions. Findings suggested that higher levels of PTSD symptoms were significantly associated with higher perceptions of power of the persecutor, inability to cope, thinking the persecution to be deserved, and lower ratings of control over the situation. Perceptions of being more helpless and in less control suggested poorer adaptation. An increased perception of threat also boosted trauma scores. Appraisals of threat stemming from delusions were also associated with greater PTSD symptoms.

Two of the core studies examined trauma-related appraisals in forensic samples of SMI patients. In the first, Calvert, Larkin, and Jellicoe-Jones (2008) explored the link between trauma and delusional ideation in a sample of 34 people (30 male) diagnosed with schizophrenia, most of whom were convicted of serious criminal offenses including manslaughter, malicious wounding, assault, arson, threat to harm, criminal damage, attempted rape and armed robbery. Self-report questionnaires were used to assess for a range of traumatic events, as well as trauma symptoms, trauma-related cognitions, delusional ideation, and paranoia. The index trauma was

identified by each participant. In this sample, negative cognitions about the self positively and significantly correlated with distress related to delusions (r=.610, N=34, p< .01) and delusion-related preoccupation (r=.496, N =34, p <.01). Also, negative cognitions about the world positively and significantly correlated with paranoia (r=.624, N=34, p <.01). Interestingly, despite the criminal convictions in this sample, self-blame was not significantly correlated with any aspect of delusional ideation or paranoia. However, findings suggest that patients holding negative cognitions about the self experienced higher levels of distress from their delusional ideas, and were highly preoccupied with them. The finding that negative cognitions about the world were associated with paranoia suggests that some participants perceived an external threat leading them to become paranoid about others and the world; this may be a safety behavior given the context of secure services and exposure to other patients with mental illness. Although further study is warranted, traumatic stress may be associated with tendency to make delusional interpretations of negative events providing evidence for cognitive factors involved in the development and maintenance of PTSD or psychosis post-trauma. Study limitations include potential sampling bias with a high refusal rate—two-thirds of those meeting study criteria declined to participate—and a reliance on self-report measures. Distributional characteristics for the key continuous variables were not reported making it difficult to determine the appropriateness of the statistical tests employed.

A second forensic study by Crisford, Dare, and Evangeli (2008) focused specifically on offense-related PTSD symptoms and guilt cognitions connected to perpetrating a violent crime in a sample of 45 offenders (2 females) with mixed SMI diagnoses. Certainly, it can be argued that committing a violent crime deviates from Criterion A1 required for a DSM diagnosis of PTSD nor does guilt alone provide sufficient grounds for the examination of negative appraisal.

However, this study was included in the core review given the emphasis on guilt-related cognitions in offenders with SMI as measured by the Trauma Related Guilt Inventory (TRGI; Kubany, 2004). Guilt-related cognitions may be considered as comparable to aspects of trauma-related self-blame measured by a subscale of the Post Traumatic Cognitions Inventory or PTCI (Foa et al., 1999).

This study tested a model of guilt-based PTSD (Lee, Scragg & Turner, 2001) consisting of *schema congruence* (the meaning derived from the trauma fits pre-existing but dormant guilt themes) and *schema incongruence* ('mismatch of meaning' so that trauma-related information cannot be successfully processed because it is incompatible with pre-existing schemes about the self, others, or the world). The researchers identified their sample by medical records with more than half diagnosed with schizophrenia-spectrum disorders. In the achieved sample, 7 were sex offenders and 38 violent offenders. Of those, 31 participants reported being psychotic at time of their offenses, and 20 were identified as misusing substances at time of offense. Researchers controlled for the possibility that a previous offense may have been more traumatic for the individuals. Hence, participants were given an opportunity to identify which offense was most distressing. Based on the trauma measure, 18 met criteria for offense-related PTSD with offense severity one of the predictors of diagnosis. Higher levels of offense-related guilt were associated with higher levels of trauma symptoms with hierarchical regression used to control for past traumatic events, offense severity, ethnicity, and negative affect. A significant difference on guilt cognitions was found between participants who had known the victims versus those who had not. Participants who committed offenses against unknown victims endorsed higher levels of guilt cognitions. No relationships were found with time lapses since offense, past trauma exposure, relationship to victim, and psychosis or substance misuse at time of offense. Notable limitations

of this study include the questionable use of regression modeling with a small, heterogeneous sample lacking sufficient statistical power. Measures of central tendency were not reported for continuous variables calling into question whether the key variables were normally distributed.

Ford and Fournier (2007) examined lifetime trauma, PTSD, substance use, health-related impairment and other psychosocial problems in a cross-sectional study of 35 SMI females recruited from a community mental health center. Sample was multi-ethnic (African American N=17 or 48%; Hispanic N=5 or 14%; Caucausian N=13 or 38%) with a median age 41 (29-68) and 63% percent (N=22) reporting an annual income of less than $10,000. All participants had histories of multiple psychiatric inpatient admissions. Primary diagnoses included schizophrenia, schizoaffective, and bipolar disorders, major depression with psychotic features, psychotic disorder NOS. Data were collected by structured interviews that included the Structured Interview for Disorders of Extreme Stress (SIDES; Pelcovitz et al., 1997) which included items on emotion dysregulation; dissociation; somatization; shame and self-loathing, conflicted / unstable relationships, and loss of sustaining beliefs. All participants reported at least one traumatic event and all but one (98%) reported multiple traumas. Current PTSD reported by 44% of the sample with lifetime PTSD (n= 18) as 53%. Those with PTSD were more likely (94%) than those without PTSD (50%) to report using two or more substances. Further, a PTSD diagnosis was associated with negative self-perceptions, alienation, and loss of sustaining beliefs. Negative self-perceptions (e.g. viewing oneself as damaged and powerless) were positively and significantly associated with PTSD diagnosis, lending support to the role of negative appraisal. A notable study limitation includes use of a small convenience sample with low statistical power. Measures of central tendency were not reported; therefore it cannot be determined whether the assumptions for use of multiple regression were met.

Two treatment studies in the core review were conducted by Mueser and colleagues (2007, 2008). Both studies utilized the PTCI as a process measure in evaluating CBT interventions tailored for PTSD among SMI community clients. Findings from both these studies suggest that changes in trauma-related cognitions may mediate changes in PTSD symptoms.

Mueser et al., (2008) conducted a randomized controlled trial (RCT) using an achieved sample of 108 clients with co-occurring SMI and PTSD. Primary SMI diagnoses included major mood disorder (85%) and schizophrenia or schizoaffective disorder (15%) with 25% also having a diagnosis of Borderline Personality Disorder. Clients were excluded if they had a psychiatric hospitalization or suicide attempt within past 3 months and / or met current criteria for DSM-IV substance dependence. Measures were administered by interviewers blinded to the treatment condition at baseline, 4 and 6 months during the treatment period, and 3 and 6 months post-treatment. The individual intervention consisted of psycho-education, stress reduction, coping skills and cognitive restructuring. CBT was compared to treatment as usual (TAU) consisting of a variety of interventions tailored to client needs including medication monitoring, case management, counseling, and vocational rehabilitation. Results suggested that CBT was superior to TAU in reducing PTSD symptoms and trauma-related cognitions. A meditation analysis suggested that PTSD symptoms were reduced as a result of a reduction in negative trauma-related beliefs. Hence, the effectiveness of CBT was mediated by trauma-related beliefs that were highly and significantly correlated with PTSD symptoms.

A second, uncontrolled treatment study by Mueser et al. (2007) examined the effectiveness of a tailored CBT group intervention for SMI persons diagnosed with PTSD. The full sample included 80 SMI clients (99% white or n =79; 79% female or n = 63) recruited for participation in the 21-week group treatment protocol. Of 80 clients initially recruited, 12

attended no group sessions. Of the remaining 68 clients, 40 completed 11 or more group sessions and were deemed "treatment completers" and 28 completed 1-10 sessions and were deemed "drop-outs." Overall, the groups had a 59% retention rate. Pre and post-assessment data was collected on 41 clients and 39 clients provided baseline data only. No significant differences were found between these two groups based on the assessment measures. Primary diagnoses included 35% (n = 28) primary personality disorder, 16 (20%) with major depression, 7 (9%) with bipolar disorder, 10 (12%) schizophrenia or schizoaffective disorder. Nineteen clients (24%) had other psychiatric diagnoses and 47 (59%) also had a current or past history of a substance use disorder. The PTCI was utilized as a process measure at pre and post treatment to assess trauma-related beliefs that were targeted by modules using cognitive restructuring. Treatment completers demonstrated significant improvements in trauma-related cognitions from baseline to the end of treatment and at three-month follow up. Findings suggested that decreases in PTSD symptoms tended to lag behind changes in trauma-related cognitions with more significant effects emerging after the cognitive restructuring modules were completed.

Limitations of Previous Research

Collectively, findings from these nine studies lend support to Ehlers and Clark's contention that negative trauma-related appraisals are associated with more adverse outcomes, including PTSD symptoms. There is also partial support for the model posited by Mueser et al. (2002) that trauma exposure—and PTSD in particular—exacerbates symptoms in persons with SMI. Based on findings from Lommen and Restifo (2009), there is potential for trauma and PTSD to be overlooked in the SMI population.

Most of these studies were hindered by small, convenience samples with limited statistical power, a preponderance of cross-sectional data, and multiple potential confounds (e.g.

symptom overlap, including depression unrelated to trauma, medication changes, substance abuse, lack of social support, chronic stress). Even the strongest prospective study using a sample of clients with mixed SMI diagnoses—the RCT conducted by Mueser et al. (2008)—had only 15% with schizophrenia-spectrum diagnoses that did not permit comparisons across or within primary disorders. This study also did not control for medication changes that may have partially accounted for the findings. The two treatment studies included here (Mueser et al., 2007, 2008) indicate that maladaptive appraisals may be modified using a cognitive restructuring approach adapted for SMI clients. Findings from both of these studies suggest potential benefit from examining underlying trauma-related appraisals about external events and encouraging the formulation of more realistic judgments to replace distorted beliefs may be beneficial in reducing emotional distress.

Based on the studies reviewed here, it may be beneficial to consider the idiosyncratic content of delusions associated with guilt, self-blame, and perceived threat. SMI clients who feel more helpless and less in control during their psychotic episodes (e.g. involuntary hospitalization, feelings of threat stemming from paranoid delusions) and perceive lower levels of social support may be at greater risk for trauma-related symptoms. In treating first-episode psychosis, it may be particularly important to examine subjective thoughts and feelings of threat and helplessness associated with the experience of psychosis and associated stimuli, including negative appraisals of involuntary treatment. Hence, assisting clients in preparing for potential relapse may increase subjective sense of control in future psychotic episodes (Chisholm et al., 2006; Mueser & Rosenberg, 2003).

Three studies reviewed here call into question the current DSM definition of PTSD by providing evidence that Criterion A1 may be too narrow, overlooking potential threats such as

psychosis, involuntary treatment, offense-related guilt, and other traumatic events typically encountered by psychiatric and forensic patients (Chisolm, et al. 2006; Jackson, et al., 2003; and Crisford, et al. 2008). Findings from Jackson et al. (2003) and Chisolm et al. (2006) suggest that a psychotic episode is potentially traumatic and may lead to avoidance of treatment-related stimuli and unsuccessful efforts to cope with emotional distress.

What qualifies as a *traumatic* stressor has generated lively debate among researchers and practitioners, notably over what McNally (2003b) has criticized as a "conceptual bracket creep in the definition of trauma." In the current DSM-IV-TR (APA, 2000), Criterion A for both PTSD and Acute Stress Disorder (ASD) specifically defines trauma exposure as an event or events involving "threatened death or serious injury, or a threat to the physical integrity of self or others" (A1) with a subjective response involving "intense fear, helplessness, or horror (A2)." However, recent studies have documented PTSD symptoms stemming from other potentially stressful—albeit non-life-threatening—events such as childbirth (Edworthy, Chasey & Williams, 2008), sexual harassment (Woods, Buchman & Settles, 2009), and "vicarious" or secondary trauma exposure (Blanchard, et al., 2004). In anticipation of the forthcoming DSM-V, some critics have proposed not only a tightening of the current definition of trauma for PTSD but a re-examination of the validity of the diagnosis itself (see Spitzer, First, & Wakefield, 2007, in their introduction to a special issue of the *Journal of Anxiety Disorders* on this topic). Also of note is a recent study by Kilpatrick, Resnick, and Acierno (2009) provides preliminary evidence that a less restrictive definition of A1 may not necessarily result in higher prevalence rates of PTSD as some critics have asserted.

Relevance for Current Study

It is critical to broaden our understanding of the potential influence of maladaptive appraisals in people with unique cognitive vulnerabilities characteristic of chronic mood and schizophrenia-spectrum disorders. As noted in the previous chapter, Beck's (1976) "cognitive triad" proposed that individuals are more prone to depression if they maintain negative beliefs about themselves, the world, and the future. Ehlers and Clark's model (2000) extends this to PTSD with an emphasis on how maladaptive appraisal processes produce a sense of ongoing threat in the absence of any actual danger. This leads to a fundamental question that provides the basis for this dissertation research: does negative appraisal of traumatic events have a unique relationship to PTSD symptoms among people diagnosed with SMI?

This study addresses an existing gap in the literature by examining the relationship of negative appraisal on PTSD symptoms in a larger, representative sample of trauma-exposed clients diagnosed with both major mood and schizophrenia-spectrum disorders. Employing a theoretical model posited by Ehlers and Clark (2000), a major aim of this study is to further test this cognitive model of PTSD with a primary hypothesis that PTSD symptom severity will be positively and significantly related to negative posttraumatic cognitions about self, world, and self-blame while controlling for critical factors such as gender, cumulative trauma, substance use, depression, and psychosis. Controlling for critical factors such as gender, cumulative trauma, substance use, and SMI symptoms is important to determine whether appraisal adds unique explanatory power to a model of PTSD in people with severe psychopathology.

Research Hypotheses

This study examined the extent to which posttraumatic appraisals are uniquely predictive of traumatic stress symptoms among people with SMI by testing four main hypotheses:

Hypothesis 1: Trauma-related negative appraisals about the *self* will have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use;

Hypothesis 2: Trauma-related negative appraisals about the *world* will have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use;

Hypothesis 3: Trauma-related negative appraisals about *self-blame* will have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use;

Hypothesis 4: Overall trauma-related appraisals (total score of *self, world, self-blame*) will have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use;

In addition, six secondary hypotheses were tested:

Hypothesis 5: There will be significant gender differences in negative appraisals of past traumatic events for *self, world,* and *self-blame* and for overall appraisal (PTCI total);

Hypothesis 6: There will be significant gender differences in reported rates of PTSD symptoms;

Hypothesis 7: There will be significant differences in types of appraisal (*self, world, self-blame*) and overall appraisal (PTCI total) based on Axis I primary diagnosis (mood disorders as compared with schizophrenia-spectrum);

Hypothesis 8: There will be significant differences in reported rates of PTSD symptoms based on Axis I primary diagnosis (mood disorders as compared with schizophrenia-spectrum);

Hypothesis 9: The number of lifetime traumatic events will be positively and significantly associated with PTSD symptoms;

Hypothesis 10: Abbreviated scales used as proxy measures for 3 types of negative appraisal and PTSD symptoms will demonstrate adequate to good reliability and validity when utilized in routine clinical practice to identify clients with SMI.

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CHAPTER FOUR

Methodology

"Nothing has such power to broaden the mind as the ability to investigate systematically and truly all that comes under thy observation in life."
-Marcus Aurelius

This chapter will provide an overview of the methods used for the current study including design, sampling strategy, sample characteristics, data collection procedures, safeguards for protection of human subjects, measures, and the statistical analysis plan.

Study Design

This study entails a secondary analysis of clinical data collected by the state of Rhode Island using a sample of 291 adults with serious mental illness who were receiving services from three different community mental centers in 2009. The data were collected between March and September 2009. The pilot study was a naturalistic, cross-sectional survey in which data were systematically collected during routine assessment and re-evaluation at the point of the client's six-month treatment plan review. Based on the results of the pilot study, recommendations were made regarding the routine use of a brief assessment and evaluation package to help guide future decisions on level of care (LOC) for all community support clients. I served as an unpaid consultant for the pilot project.

Sampling Strategy

Sample from pilot study

Three out of eight community mental health centers in Rhode Island participated in the pilot study of clients enrolled in their respective community support programs (CSP): South Shore Mental Health Center; East Bay Mental Health Center; and Providence Center. Community support programs (CSP) are designed to serve clients with severe and persistent

mental illness who require a range of services to achieve optimum independent functioning. At the time of the pilot study, South Shore Mental Health Center and East Bay each were serving approximately 400 CSP clients, and the Providence Center had approximately 750. The pilot study aimed for a total sample of 400 (100 from South Shore and East Bay, 200 from Providence Center) based on a sampling frame of 1,550, the combined total of CSP clients for the three agencies. The number of cases in the target sample (n = 400) well exceeds the 217 cases recommended for 98% precision or better, 99 samples in 100 as noted by Smith (1981) assuming random sampling.

The total achieved sample for the pilot study was 387 or a 97% response rate. The sample was selected based on the anniversary date of a given client's admission to CSP at which time a mandatory treatment plan review is conducted by the primary clinicians every six months. It is the responsibility of the Quality Assurance Director at each agency to monitor the completion of all treatment plan reviews to comply with state mental health regulations. The participating agencies have varying demographic characteristics that also bolster the argument for representativeness of this sample. For example, Providence Center is a large, urban agency serving a multi-ethnic client population, whereas Easy Bay serves a largely Caucasian suburban catchment area and South Shore a relatively rural area with an overwhelmingly Caucasian client population. Strictly speaking, this sampling method does not meet the definition of a systematic random sample as defined by Engel and Schutt (2005): "A method of sampling in which sample elements are selected from a list or from sequential files, with every *n*th element being selected after the first element is selected randomly within the first interval" (pp. 115-116). However, given that these cases were selected consecutively based on the anniversary of their admission

dates—with little or no potential for sampling bias—this sample can be considered highly representative of all clients enrolled in these programs within the three participating CMHCs.

Based on previous studies conducted with a similar population in the state of Rhode Island (O'Hare and Sherrer, 2009; O'Hare, Sherrer, Yeamen & Cutler, 2009), it was expected that roughly 65-75% of the 387 clients in the pilot sample would report at least one lifetime traumatic event. Therefore, it was estimated that the achieved sample would be in the range of 250 to 290 cases. The final sample used for this study was based on data from 291 clients, of adequate size to conduct the proposed analysis with 6 independent variables given that regression can be conducted with about 30 cases per independent variable (Polit, 1996; Abu-Bader, 2009).

Sample Characteristics for Present Study

Demographic characteristics for the 291 clients in the study sample are presented in Table 3. Client characteristics with respect to psychiatric history can be found in Table 4. Slightly more than half (n = 161 or 55.3%) of all reporting clients were females. Three clients did not report their gender. More than half of the sample (n = 175 or 60.1%) never married with 90 clients (30.9 %) reporting their marital status as separated, widowed or divorced. For race / ethnicity, 70.8% (n = 206) reported their race as white, 11.7% (n = 34) African-American, 8.2% (n = 24) Hispanic and 9.3% (n = 27) as "other." The mean age of clients was 47.3 years. More than a third of the sample did not graduate from high school (34.4%) and the average years of education 11.5. Only 22.2% reported education beyond high school graduation.

The median annual income for this group was $9000.00 and a high percentage (85.6% or n = 237) were unemployed. Most clients (n = 240 or 82.5%) reported SSDI as their primary income source. In terms of insurance status, 29.6% (n = 86) were covered by Medicaid 12% (n =

35) were covered by Medicare, 3.8% (n=11) had other third party insurance, and 6.2% (n=18) reported being uninsured.

In terms of their psychiatric histories, nearly all clients (94.2% or n = 274) had been hospitalized at least once in their lifetimes and 21% (n=61) reported at least one hospitalization over the past year. Forty-seven percent (n = 137) were given a primary Axis I diagnosis of schizophrenia and 52.9% (n = 154) were given a primary diagnosis of a major mood disorder. For secondary diagnoses, nearly one-third (n=89 or 30.6%) were diagnosed with a co-occurring substance use disorder. Clients' median length of stay at these three agencies was 9 years, and their median length of stay in their respective programs was 2 years.

Measurement

Measures used in the pilot study that pertain to the key constructs for this proposed dissertation are described in this section. Instruments can be found in *Appendix A.*

PTSD Symptom Scale (PSS-I; brief version)

A three-item, abbreviated version of the PTSD Symptom Scale (Foa & Tolin, 2000) served as the dependent variable in this study. The development of the brief scale is explained in detail below. The full scale, composed of 17 items corresponding to DSM criteria for PTSD (APA, 2000), was originally developed with females who had been sexually assaulted. It is available in both client self-report form (PSS-SR) and practitioner structured interview form (PSS-I). The PSS provides a total score as well as subscale scores for re-experiencing, avoidance and arousal symptoms associated with PTSD. Items are measured on a four point (0-3) frequency/severity scale. The PSS has shown excellent sensitivity and specificity with DSM structured interview schedule (SCID; Norris & Riad 1997) and has been shown to have good concurrent validity with the Clinician Administered Post-traumatic Stress Disorder Scale (CAPS-

1; Foa & Tolin, 2000). When using the PSS-I, the practitioner first identifies the client's target trauma in the interview, and, secondly, uses all available information about the client to score each item. Clients are asked to identify the traumatic event that is most distressing for them, and to respond to the items of the PSS-I with that event in mind. PTSD severity is determined by totaling the 17 PSS-I item ratings. Scores range from 0-51.

For purposes of the pilot study, a brief, three-item version of the PSS-I was developed to streamline the demands on clinical staff in conducting the client interviews. The brief version of the scale was developed empirically with data from a previous study with a very similar sample of clients diagnosed with SMI (see O'Hare, Shen and Sherrer, 2010) by selecting the items that correlated highest with each of the three respective subscales (i.e., re-experiencing, avoidance, hyperarousal). Those items and Pearson correlations are as follows:

- To measure *re-experiencing, item #4* was selected: "Have you been feeling very emotionally upset when you were reminded of the trauma (for example, feeling scared, angry, sad, guilty)?" This item showed a high and significant correlation with the full re-experiencing sub-scale ($r = .86$, $p < .01$).

- To measure *avoidance, item #10 was selected:* Have you been feeling distant or cut off from people around you since the trauma? This item showed a high and significant correlation with the full sub-scale ($r = .86$, $p<.01$).

- To measure *hyperarousal, item #15 was selected*: "Have you been having trouble concentrating (for example, drifting in and out of conversations, losing track of a story on television, forgetting what you read)?" This item correlated with the full sub-scale at ($r = .87$, $p<.01$). Further analysis revealed a Cronbach alpha for the "brief PTSD screen" of .83. The brief PSS also correlated with the full 17-item PTSD scale at $r = .93$, $p<.01$). In

sum, the brief PTSD screen appears to show good internal consistency and high degree of concurrent validity with the full PSS-I.

Subscale scores for the brief PTSD scale ranges from 0 (“not at all”) to 3 (“five or more times per week—very much”). By summing the three items, an overall score can be calculated, ranging from 0 to 9.

Posttraumatic Cognitions Inventory (PTCI; brief version)

The main independent variable for this study, negative appraisal, was measured using nine items from the Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin & Orsillo, 1999), one of the most widely used measures of trauma-related thoughts and beliefs. The full PTCI is a 36-item self-report scale that assesses cognitions about oneself (e.g. “I have been permanently changed for the worse”), the world (e.g. “You can never know who will harm you”), and self-blame (e.g. “The event happened because of the way I acted”) using a 7-point Likert scale with response options ranging from 1 (“totally disagree”) to 7 (“totally agree”). Higher scores on the PTCI suggest greater endorsement of negative beliefs associated with a traumatic event(s). Five of the nine core studies examining negative appraisal in trauma-exposed clients with SMI employed the PTCI with adequate to excellent reliability and validity (Mueser et al. 2007, 2008; Lommen & Restifo, 2009; Calvert, Larkin & Jellicoe-Jones, 2008; Kilcommons & Morrison, 2005) supporting the use of selected items to measure negative appraisal in this proposed dissertation study.

The pilot data that were analyzed for purposes of this study utilized nine items (three items from each subscale) from the PTCI. The decision to use selected items from the PTCI as opposed to the full scale was based on clinical utility and time constraints bearing in mind the primary purpose of the pilot study. The nine items incorporated into the survey instrument were

identified by an examination of the highest factor loadings reported in the development and validation of the scale (Foa et al. 1999) based on data collected from a total sample of 601 individuals (both traumatized and non-traumatized) recruited from sites in the U.S. and Great Britain. In the development of the PTCI, the factor structure was tested with three samples (the traumatized sample was randomly split into two samples and data from the non-traumatized individuals were analyzed separately). Selection of the nine items was determined by calculating a mean of the three factor loadings for each item as reported by Foa et al. (1999), then by identifying the three highest loading factors within each subscale. Mean factor loadings for the nine items were calculated as follows: *self* (.85, .84, .78); the world (.71, .71, .72) and self-blame (.81, .75, .74). The final nine-item version of the PTCI can be found in *Appendix A.*

Using a self-identified traumatic event as a reference point, clients were asked to respond to nine statements by selecting the response that most accurately reflected their current appraisal of the trauma. Response options ranged from 1 ("strongly disagree") to 5 ("strongly agree") with 3 indicating "not sure." Individual subscale scores (ranging from 3 to 15) were obtained for each of the three types of negative appraisal. By summing the three subscale scores, an overall PTCI score may range from 9 to 45.

Lifetime trauma

Another independent variable concerned past traumatic events that the clients had experienced. Information on past history of trauma was obtained using items drawn from well-established literature on measuring frequency of common traumatic events in both the general populations as well as with people diagnosed with SMI (e.g., Norris & Riad, 1997; Mueser et al. 2002) in both general and clinical populations. Items include: having been physically abused, sexually abused, saw another person seriously harmed or killed in a combat, home or crime

situation, experienced the unexpected death of a close friend, family member or loved one, was homeless for more than one day, suffered a life-threatening injury or illness that caused you to fear for your life. The item on homelessness does not conform to Criterion A1 for a DSM diagnosis for PTSD. However, it was not excluded for purposes of the study. More detail on this will be provided in the results and discussion chapters. Each item was addressed and explored as needed by the interviewer, and the respondent provided an estimate of how many times that event had occurred in their lifetime corresponding to the following response options:

(1) None **(2)** One time **(3)** 2-5 times **(4)** 6-10 times **(5)** More than 10 times

Items for lifetime traumatic events were recoded using midpoints as estimates so that 1=0, 2=1, 3=3.5, 4=8, 5=11 enabling this to be treated as a continuous variable. A total estimate was calculated for each client to allow for examination of overall lifetime trauma. From this list, clients were asked to identify their "most stressful or traumatic event." Clients were allowed to identify another traumatic event beyond the list provided if warranted. Interviewers were asked to record any alternative traumatic events on the questionnaire sheet.

BASIS-24

Three independent variables measuring depression, psychosis, and alcohol / other drug use (main control variables) were obtained using relevant subscales from the BASIS-24, an improved version of the original BASIS-32 (Eisen, Dill & Grob, 1994). This questionnaire, which can be administered by self report or in a clinical interview, contains 24 items that measure six domains of functioning: depression/functioning, psychotic symptoms, interpersonal functioning, emotional lability, self-harm and substance abuse. The scale employs a combination of frequency and severity scales to gauge client functioning in these six domains over the previous week. Psychometric data for the most part are excellent in that the BASIS-24 has

consistently shown with both large in-patient and out-patient samples very good to excellent internal consistency, reliability, sound factor structure, good concurrent validity when correlated with other well-established mental health scales, and good sensitivity to change with moderate to large and significant effect sizes produced over an 8 week period. The scale has also been shown to be relatively invariant by race and gender (Eisen, Norman, Belanger et al. 2004; Eisen, Gerena, Ranganathan, Esch & Idiculla, 2006).

The depression subscale contains six items (1, 2, 3, 9, 10, 12) with possible scores ranging from 6 to 30. Higher scores correspond to greater severity of symptoms. One of the depression items (#9) is reverse scored and this was converted prior to the statistical analyses. The psychosis subscale contains four items (items 14-17) with scores ranging from 4 to 20. Higher scores indicate greater severity of psychotic symptoms. The alcohol and other drug use subscale contains four items (items 21-24) with possible scores ranging from 4 to 20. Higher scores suggest greater severity of problems with substance use.

Procedures

Private, face-to-face interviews were conducted as part of routine care by the primary clinicians at the point of each client's six-month treatment plan review. Client identification numbers were not used in the data collection for the pilot study. Instead, substitute numbers specific to the project were assigned. Unique usernames and passwords were provided to each interviewer. The list containing client official ID numbers were kept safely in the possession of each agency's Director of Quality Assurance. All three agencies are accredited by major national healthcare accreditation agencies (i.e., either Joint Commission for the Accreditation of Healthcare Organizations or Commission on Accreditation of Rehabilitation Facilities), have seasoned quality assurance departments, and stringent procedures for protection of client rights.

All agencies follow strict confidentiality and security protocols as outlined in licensing and federal regulations (HIPPA, CRF 42, part 2) as well as practice standards required for accreditation. As the pilot data were collected as part of routine care, no institutional review was needed for the initial study. However, access to the secondary data for research purposes was subjected to agency approval. Permission letters were obtained from the three community mental health centers and the RI state mental health authorities to utilize these data for dissertation and other research purposes. Approval for this study was obtained from the Office of Research Compliance at Boston College.

Statistical Analysis Plan

Statistical analyses were conducted with Statistical Package for the Social Sciences software (SPSS Version 16.0) in five main steps. First, univariate analysis of all background and demographic data was conducted. Second, sums for all key sub-scales were computed including measures of central tendency to determine distributional characteristics and test assumptions for further statistical analysis. Variables deviating from normality were to be transformed to meet the statistical assumptions required for multiple regression if needed (Abu-Bader, 2006; Tabachnick and Fiddell, 2001). In the third step, a Cronbach's alpha for each sub-scale was produced. Fourth, bivariate analyses were conducted, including a correlation matrix for key variables and t-tests to examine differences by key background variables (specifically gender and Axis I diagnosis) for all key continuous variables (assuming normal distribution). In step five, multiple regression models were used to test the four main hypotheses (#1 through #4) that each PTCI subscale will significantly predict PTSD symptoms while controlling for gender, total lifetime traumatic events, alcohol/other drug use, symptoms of depression and symptoms of psychosis (as measured by the BASIS-24 subscales).

The assumptions of multiple regression were met as follows (Abu-Bader, 2006; Tabachnick and Fidell, 2001; Polit, 1996):

1. *A sample representative of the population from which it has been selected so findings may be generalized accordingly.* As argued earlier in this chapter, the full sample from the pilot study included selected clients receiving community support services at three mental health centers. Data were collected via clinical interviews prompted by a mandatory treatment plan review with the completion of the review corresponding to the anniversary of a given client's admission date. Although this method may not be considered random in the strictest sense, it can be argued that it is far more rigorous and systematic than a convenience sample, and therefore highly representative of the population of community support clients in the three centers.
2. *The dependent variable that is continuous and must be measured at the interval level or higher*—in this case PTSD symptoms as measured by the brief PSS-I.
3. *Normal distribution for all key variables* was met based on initial examination of the data.
4. *Nominal data* (in this case gender), *were recoded to dummy variables prior to entering it into the analysis.*
5. *Linearity, in that the relationship between the criterion and all factors is assumed to be a linear relationship*.
6. *Distributions of the residuals (differences between observed and predicted scores) achieved or approached normality.*
7. *Homoscedasticity, or that for each value of the independent variables, the dependent variable was normally distributed or had equal variance.*

8. *Multicollinearity (high correlation) between independent variables was assessed by examining the tolerance estimates which were all within acceptable range.*
9. *The sample size (n = 291) was determined to have sufficient statistical power to perform multiple regression to decrease the likelihood of Type II errors.*

After ensuring that all assumptions for multiple regression noted above were met, PTSD symptoms (PSS-I total) was entered as the dependent variable. Separate regression analyses were conducted for each PTCI subscale (self, world, self-blame) and the total PTCI score while controlling for gender, total lifetime traumatic events, symptoms of depression and psychosis, and alcohol/other drug use. Independent variables were entered in the following order to test the first four hypotheses: 1) gender; 2) total trauma score; 3) depression sub-scale scores from the Basis 24; 4) psychosis sub-scale scores from the Basis 24; 5) alcohol and other drugs sub-scale scores from Basis 24; and 6) the designated PTCI sub-score.

For the main hypotheses (#1 through #4) in which regression was employed, testing of the overall models included adjusted R squared, changes in F, and the F test (ANOVA). Testing of the individual variables included standardized beta, t-test, significance level, and part correlation. To determine if assumptions were met, the following tests were conducted: the Durbin Watson test for non-independence of errors; tolerance levels to assess multicollinearity; and a residual plot to determine normal distribution of error.

Six secondary hypotheses (#5 through #10) were tested using the procedures outlined below.

Hypothesis 5: There will be significant gender differences in negative appraisals of past traumatic events for *self, world,* and *self-blame* and for overall negative appraisal (PTCI total).

This hypothesis was tested by examining the results from t-tests conducted in step four of the statistical analyses to determine level of significance for each type of appraisal.

Hypothesis 6: There will be significant gender differences in reported rates of PTSD symptoms. This hypothesis was tested by examining the results from t-tests conducted in step four of the statistical analyses to determine level of significance by gender in overall PTSD scores based on the three-item scale.

Hypothesis 7: There will be significant differences in types of appraisal (*self, world, self-blame*) and overall negative appraisal (PTCI total) based on Axis I primary diagnosis (mood disorders as compared with schizophrenia-spectrum). This hypothesis was tested by examining the results from t-tests conducted in step four of the statistical analyses to determine level of significance by diagnosis to determine potential differences in types of appraisal based on the subscale scores of the brief PTCI.

Hypothesis 8: There will be significant differences in reported rates of PTSD symptoms based on Axis I primary diagnosis (mood disorders as compared with schizophrenia-spectrum). This hypothesis was tested by examining significant findings from t-tests conducted in step four of the statistical analyses to determine potential differences in overall PTSD scores by diagnosis.

Hypothesis 9: The number of lifetime traumatic events will be positively and significantly associated with PTSD symptoms. This hypothesis was tested by examining the correlation between lifetime traumatic events and PTSD symptoms to determine if the relationship is statistically significant.

Hypothesis 10: Abbreviated scales used as proxy measures for 3 types of negative appraisal and PTSD symptoms will demonstrate adequate to good reliability and validity when utilized in routine clinical practice to identify clients with SMI. This hypothesis was tested by examining

the relevant Cronbach's alphas produced for the brief PTSD scale and the three subcales of the brief PTCI to determine reliability.

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CHAPTER FIVE

Results

"Thus have I made as it were a small globe of the intellectual world,
as truly and faithfully as I could discover."

-Francis Bacon (1605)

The following chapter outlines the study results with descriptions of statistical findings for each hypothesis. First, univariate data from all individual scale items will be presented, including measures of central tendency. Second, results from the bivariate analyses will be noted including t-tests that compared the sample by gender and diagnosis on key variables. Notable findings from a Pearson correlation matrix of key study variables will then follow. Next, the linear regression models for testing the four main hypotheses will be summarized. Finally, results for the secondary hypotheses will be described.

Univariate Data for Key Study Variables

Results from the preliminary univariate analysis of the key study items are presented in Table 5.

PTSD Symptoms (dependent variable)

Results from the PSS-I brief version suggest that 67.7% of clients (n = 197) had at least one episode of *re-experiencing* during the previous seven days based on a frequency estimate in response to the question "Have you been feeling very emotionally upset when you were reminded of the (index) trauma—for example, feeling scared, angry, sad, guilty?" With respect to *avoidance,* 49.8% (n = 145) of clients reported at least one episode over the previous seven days in response to the question "Have you been feeling distant or cut off from people around you since the (index) trauma?" At least one instance of *hyperarousal* based on the question "Have you been having trouble concentrating (for example drifting in and out of conversations,

losing track of a story on television, forgetting what you read?" was endorsed by 59.8% (n = 171) for the previous seven days.

Posttraumatic Cognitions (main independent variable)

Based on the nine items adapted from the PTCI, more than one-third agreed or strongly agreed that their lives had been destroyed by the trauma (34.3%, n = 100). About one quarter of the sample (25.4%, n = 71) agreed or strongly agreed that they had been permanently changed for the worse due to the identified trauma. Items corresponding to negative appraisals about the world received the greatest endorsement in the sample with over half of the clients (55.6%, n = 162) agreeing strongly agreeing that "I have to be especially careful because you never know what can happen next." More than half (51.6%, n = 150) agreed or strongly agreed with the statement "You never know who will harm you," and 44% (n = 128) agreed or strongly agreed that "People are not what they seem."

Negative appraisals of self-blame received the lowest endorsement of all the PTCI items. The statement "There is something about me that made the event happened" generated agreement or strong agreement from only 16.8% (n = 49) of the sample followed by "The event happened because of the way I acted" (16.1%, n = 47) and "The event happened to me because of the sort of person I am" (14.7%, n = 43).

Lifetime trauma (key independent variable)

Lifetime trauma was captured from three different vantage points. First, clients were asked if a particular event had ever happened to them. Second, clients estimated how many times the event had occurred. Third, clients were asked to identify the most stressful or traumatic event which was coded as the index trauma.

In this sample, the *unexpected death of a close friend, family member, or loved one* was the most frequently cited traumatic event, endorsed by 84.5% (n = 246) of the clients. This was followed by *physical abuse* with 56.4% (n = 164) reporting at least one lifetime episode. Approximately one-third of the sample (32.7% or n = 95) reported being physically abused an estimated six or more times during their lifetimes. This was followed by being *homeless for more than a day* (46.7%, n = 136), *life threatening injury or illness* (41.6%, n = 121), *sexual abuse* (40.9%, n = 119) and *saw another person seriously harmed or killed in combat, home, or crime situation* (34.7%, n = 101).

Index Trauma

The most distressing traumatic events or index traumas for this sample included *unexpected death of a close friend, family member, or loved one* (36.8%, n = 107), *sexual abuse* (16.2%, n = 47), *other* (12.7%, n = 37) and *physical abuse* (10.7%, n = 31). These were followed by *life-threatening illness or injury* (8.2%, n = 24), being *homeless for more than one day* (6.9%, n = 20) and *saw another harmed or killed* (5.5%, n = 16).

In the category of "other," 39 clients provided qualitative comments describing events other than those included in the questionnaire that they considered to be their most traumatic. For the most part, the alternative events deviated from Criterion A1 based on DSM criteria for PTSD (APA, 2000). For example, eight clients cited deaths among close family members that were not sudden or unexpected. Other examples included incarceration of husband or father, loss or surrender of parental rights to their minor children, being removed from mother's custody by child welfare officials, being placed in an orphanage after parental divorce, and dealing with an emotionally-abusive relationship. One client reported moving to the United States as the most traumatic event. Several clients cited being diagnosed with a major mental illness or struggling

with specific types of psychiatric symptoms as their most traumatic event. Other types of stressors related to SMI were reported including involuntary hospitalization (and loss of pets related to being in the hospital) and suicide attempts.

Basis 24: depression, psychosis, alcohol /other drugs (control variables)

The main control variables were derived from three subscales of the Basis 24 with the measures of central tendency presented in Table 6. The mean score for the depression was 15.6 (*SD* = 5.41) with a potential score range of 6-30 for six items. The mean score for psychosis was 7.31 (*SD* = 3.38) with a score range of 4-20 for four items. Alcohol and other drugs had a mean score of 6.11 (*SD* = 3.31) based on four items with a score range of 4-20.

Alphas for Key Scales

In Table 6, measures of central tendency and Cronbach's alpha for all key subscales are presented. These include the three Basis-24 subscales that served as main control variables (depression, psychosis, alcohol / other drugs), brief PTSD scale, and the three subscales for Posttraumatic Cognitions (*self*, *world*, *self-blame*).

All subscales approached normal distribution and did not require any data transformations to meet the statistical assumptions required for multiple regression (Abu-Bader, 2006; Tabachnick and Fiddell, 2001). The alphas for all subscales demonstrated good to excellent reliability with all but one at .80 or above (.70 on the psychosis subscale of the Basis 24).

Multiple Regression Results for Main Hypotheses

Four hierarchical regression models were used to test the main hypotheses (#1 through #4) that each PTCI subscale and the PTCI total would be significantly associated with PTSD

symptoms while controlling for gender, total lifetime traumatic events, symptoms of depression and psychosis, and alcohol/other drug use as measured by the BASIS-24 subscales.

After ensuring that assumptions for multiple regression were met, PTSD symptoms (PSS-I total) was entered as the dependent variable. Independent variables were entered in two blocks. First, the control variables of gender, total trauma score, and three separate Basis 24 subscale scores for depression, psychosis, and alcohol /other drugs were entered in block one to produce a simultaneous regression model or Model 1. Next, the main independent variable—the designated PTCI sub-score—was entered in the second block to produce a second regression model or Model 2. This allowed for an examination of the effect of the main independent variable (the specified appraisal factor) in Model 2 after the effect of other variables has been controlled (Polit, 1996, p. 270) in Model 1.

Testing of the regression models included adjusted R^2, changes in F, and the F test (ANOVA). Testing of the individual variables included standardized beta, t-test, significance level, and part correlation. To determine that assumptions were met, the following tests were conducted: the Durbin Watson test for non-independence of errors; tolerance levels to assess for multicollinearity; and a residual plot to determine normal distribution of errors.

Regression model for Hypothesis 1 –negative appraisals of self

For Hypothesis 1, it was posited that trauma-related negative appraisals about the *self* would have a positive and significant association with PTSD symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

Model 1 produced from the first block with the five control variables was significant (F = 29.44, df = 5/263, p <.001) with an adjusted R^2 = .35. Significant factors were gender, psychosis

(both at p <.05), lifetime trauma, and symptoms of depression (both at p <.001). Model 2 produced from the second block that introduced the key independent variable of negative self appraisal resulted in an R^2 change of .10 with an F Change of 50.95 which was significant (p <.001). The overall model also was significant (F = 37.69, df = 6/262, p <.001) with an adjusted R^2 = .45. Hence, the amount of unique variance in PTSD symptoms explained by negative self appraisal while controlling for gender, lifetime trauma, depression, psychosis, and alcohol / other drugs was 10% exceeding the explanatory power of all other individual factors in the model based on examination of the squares of the part correlations. These findings provide support for Hypothesis 1. With the inclusion of negative *self* appraisal In Model 2, gender, lifetime trauma, and depression remained significant. However, psychosis became non-significant (p = .404). Alcohol / other drugs remained non-significant in Model 2 (p = .915). See Table 9 for a summary of the results.

The standardized residual plot revealed normal distribution of errors, a finding that was supported by the Durbin-Watson statistic (1.95, p < .001). According to Tabachnick and Fidell (2001) if the Durbin-Watson statistic is significant, it indicates non-independence of errors (p. 121). An acceptable range for the Durbin-Watson is 1.50-2.50. Diagnostics to assess multicollinearity were all in acceptable range. Tolerance (an indication of the percent of variance in the predictor that cannot be accounted for by the other predictors) indicated levels all above .10 and VIF values were all less than 10.

Regression model for Hypothesis 2—negative appraisals of world

For Hypothesis 2, it was posited that trauma-related negative appraisals about the *world* would have a positive and significant association with traumatic stress symptoms after

controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

Model 1 produced from the first block with the five control variables was identical to that of Hypothesis 1: significant (F = 29.44, df = 5/263, p <.001) with an adjusted R^2 = .35. Significant factors were gender, psychosis (both at p <.05), lifetime trauma, and symptoms of depression (both at p <.001). Model 2 produced from the second block that introduced the key independent variable of negative *world* appraisal resulted in an R^2 change of .04 with an F Change of 18.97 which was significant (p <.001). The overall model was significant (F = 29.37, df = 6/262, p <.001) with an adjusted R^2 = .39. Results suggest that the amount of unique variance in PTSD symptoms explained by negative *world* appraisal while controlling for gender, lifetime trauma, depression, psychosis, and alcohol / other drugs was 4%. Examination of the squares of the part correlations suggest that negative *world* appraisals had greater explanatory power in Model 2 than the other predictor variables with the exception of depression which accounted for 8% of the variance. Therefore, in support of Hypothesis 2, trauma-related appraisal of the world was determined to have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

With the inclusion of negative *world* appraisal in Model 2, gender, lifetime trauma, and depression remained significant. However, psychosis became non-significant (p = .447). Alcohol / other drugs remained non-significant in Model 2 (p = .770). See Table 10 for a summary of the results.

The standardized residual plot revealed normal distribution of errors, a finding that was supported by the Durbin-Watson statistic which was significant (1.98, p < .001) indicating non-

independence of errors. Diagnostics to assess multicollinearity were all in acceptable range. Tolerance indicated levels all above .10 and VIF values were all less than 10.

Regression model for Hypothesis 3—negative appraisals of self-blame

For Hypothesis 3, it was posited that trauma-related negative appraisals about *self-blame* would have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

Model 1 produced from the first block with the five control variables was significant (F = 29.44, df = 5/263, p <.001) with an adjusted R^2 = .36. Significant factors were gender, psychosis (both at p <.05), lifetime trauma, and symptoms of depression (both at p <.001). Model 2 produced from the second block that introduced the key independent variable of negative *self-blame* resulted in an R^2 change of .03 and an F Change of 13.60 which was significant (p <.001). The overall model was significant (F = 27.91, df = 6/261, p <.001) with an adjusted R^2 = .38. Results suggest that the amount of unique variance in PTSD symptoms explained by trauma-related *self-blame* while controlling for gender, lifetime trauma, depression, psychosis, and alcohol / other drugs was 3%. Examination of the squares of the part correlations suggest that *self-blame* had greater explanatory power in Model 2 than the other predictor variables with the exception of depression which accounted for 8% of the variance and lifetime trauma at 4%. Therefore, in support of Hypothesis 3, trauma-related *self-blame* was determined to have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

With the inclusion of *self-blame* in Model 2, gender, lifetime trauma, and depression remained significant. However, psychosis became non-significant (p = .122) and alcohol / other drugs remained non-significant (p = .667). See Table 11 for a summary of the results.

The standardized residual plot revealed normal distribution of errors, a finding that was supported by the Durbin-Watson statistic which was significant (1.86, p < .001) indicating non-independence of errors. Diagnostics to assess multicollinearity were all in acceptable range. Tolerance indicated levels all above .10 and VIF values were all less than 10.

Regression model for Hypothesis 4—negative appraisal total

For Hypothesis 4, it was posited that overall trauma-related appraisals (total score of *self, world, self-blame*) would have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

Model 1 produced from the first block with the five control variables was significant identical to that of Hypothesis 3: (F = 29.44, df = 5/263, p <.001) with an adjusted R^2 = .36. Significant factors were gender, psychosis (both at p <.05), lifetime trauma, and symptoms of depression (both at p <.001). Model 2 produced from the second block that introduced the key independent variable of the total score for negative appraisal (all nine items of the PTCI combined) resulted in an R^2 change of .11 and an F Change of 51.32 which was significant (p <.001). The overall model was significant (F = 37.71, df = 5/262, p <.001) with an adjusted R^2 = .45. Results suggest that the amount of unique variance in PTSD symptoms explained by overall trauma-related appraisal while controlling for gender, lifetime trauma, depression, psychosis, and alcohol / other drugs was 11%. Examination of the squares of the part correlations suggest that overall negative appraisals had far greater explanatory power in Model 2 than the

other predictor variables including depression which accounted for only 5% of the variance. Therefore, in support of Hypothesis 4, overall trauma-related appraisal was determined to have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

With the inclusion of the total appraisal score in Model 2, gender and lifetime trauma remained significant at p <.05. Depression also remained significant at p <.001. However, psychosis became non-significant (p = .841) and alcohol / other drugs remained non-significant (p = .561). See Table 12 for a summary of the results.

The standardized residual plot revealed normal distribution of errors, a finding that was supported by the Durbin-Watson statistic which was significant (1.86, p < .001) indicating non-independence of errors. Diagnostics to assess multicollinearity were all in acceptable range. Tolerance indicated levels all above .10 and VIF values were all less than 10.

Bivariate Tests

Bivariate analyses included a correlation matrix for key variables (see Table 8), a chi-square test of independence to examine the relationship between two key categorical variables (gender and diagnosis), and t-tests to examine differences by key background variables of gender and Axis I diagnosis (means and standard deviations are summarized in Table 7).

Significant differences by gender

Chi- square analyses indicated that women were significantly more likely to be diagnosed with a major mood disorder (MMD) than males who were more likely to be diagnosed with a schizophrenia-spectrum disorder (X^2 (1, 288) = 16.2; p < .001; Φ = .24, p <.001). In this sample, 103 females (66.9%) had a diagnosis of a MMD as compared with 51 males or 33.1%. Based on

the Chi-square analysis, 76 males (56.7%) had a SSD diagnosis as compared with 58 females or 43.3%.

An independent samples t-test demonstrated that females reported significantly more negative appraisals about the world [t (284) = -3.09, $p < .01$]. No significant gender differences were found for negative appraisals regarding the self or self-blame. Females also reported significantly higher rates of PTSD symptoms than men [t (281) = -3.84, $p < .01$] as well as significantly more lifetime trauma [t (286) = -2.66, $p < .01$] and depressive symptoms [t (283) = -2.85, $p < .01$].

Significant differences by diagnosis

A number of significant differences were found in t-test results comparing clients with schizophrenia-spectrum disorders (SSD) with major mood disorders (MMD) on key variables. One notable difference is that clients with MMDs reported significantly more lifetime trauma than clients with SSDs [t (289) = -5.25, $p < .01$]. Significant differences in types of appraisal (*self, world, self-blame*) based on Axis I primary diagnosis were also found. Clients with MMDs reported significantly more negative appraisals regarding the *self* [t (288) = -3.27, $p < .01$] as well as the *world* [t (287) = -3.95, $p < .01$] than people with SSDs. However, no differences by diagnosis were found on appraisals of *self-blame*. Clients with MMDs also reported significantly higher rates of PTSD symptoms than people with SSDs [t (284) = -4.56, p < .01]. As would be expected based on relevant DSM criteria, clients with MMDs reported significantly more symptoms of depression than clients with SSDs [t (286) = -3.78, $p < .01$]. Similarly, clients with SSDs reported more symptoms of psychosis [t (288) = 2.97, $p < .01$].

Significant associations from Pearson correlation analyses

Table 8 summarizes findings in the Pearson correlation matrix showing a number of significant associations among the key study variables. The number of lifetime traumatic events was positively and significantly associated with PTSD symptoms ($r = .384$, $p < .01$). In examining items from the PTCI, moderate positive and significant associations were found between appraisals of *self* and *world* ($r = .565$, $p < .01$), *self* and *self-blame* ($r = .395$, $p < .01$) and *world* and *self-blame* ($r = .316$, $p < .01$). Positive and significant associations with PTSD symptoms were found for all three PTCI subscales—*self* ($r = .591$, $p < .01$), *world* ($r = .493$, $p < .01$), and *self-blame* ($r = .335$, $p < .01$).

Total lifetime trauma estimates was found to have a positive and significant association with all key variables with the exception of psychosis, the only non-significant relationship in the correlation analysis.

Results for Secondary Hypotheses

Findings for the six secondary hypotheses are summarized below.

Hypothesis 5: There will be significant gender differences in negative appraisals of past traumatic events for *self, world,* and *self-blame* and for overall appraisal (PTCI total). This hypothesis was tested by examining the results from t-tests conducted in step four of the statistical analyses to determine level of significance for each type of appraisal. An independent samples t-test demonstrated that females reported significantly more negative appraisals about the world, that is, they were more likely to endorse beliefs about others' intent to harm them or not being what they seem [t (284) = -3.09, $p < .01$]. No significant gender differences were found for negative appraisals regarding the self or self-blame. For overall appraisal, females reported significantly more trauma-related appraisals (higher total PTCI score) than males

[t (283) = -2.14, $p < .05$]. Hence, hypothesis #5 received partial support.

Hypothesis 6: There will be significant gender differences in reported rates of PTSD symptoms. This hypothesis was tested by examining the results from t-tests conducted in step four of the statistical analyses to determine level of significance by gender in overall PTSD scores based on the three-item scale. Findings supported this hypothesis based on t-test results that females reported significantly higher rates of PTSD symptoms than men [t (281) = -3.84, $p < .01$]. Females also reported significantly more lifetime trauma [t (286) = -2.66, $p < .01$] and depressive symptoms [t (283) = -2.85, $p < .01$].

Hypothesis 7: There will be significant differences in types of appraisal (*self, world, self-blame*) and overall appraisal (PTCI total) based on Axis I primary diagnosis (mood disorders as compared with schizophrenia-spectrum). This hypothesis was tested by examining the results from t-tests conducted in step four of the statistical analyses to determine level of significance by diagnosis to determine potential differences in types of appraisal based on the subscale scores of the brief PTCI. This hypothesis received partial support in the prediction of significant differences in types of appraisal (*self, world, self-blame*) based on Axis I primary diagnosis. Clients with MMDs reported significantly more negative appraisals regarding the *self* [t (288) = -3.27, $p < .01$] as well as the *world* [t (287) = -3.95, $p < .01$] than people with SSDs. However, no differences by diagnosis were found on appraisals of *self-blame*. For overall appraisal, clients diagnosed with MMDs reported significantly more trauma-related appraisal (higher PTCI scores) than clients with SSDs [t (286) = -3.20, $p < .01$].

Hypothesis 8: There will be significant differences in reported rates of PTSD symptoms based on Axis I primary diagnosis (mood disorders as compared with schizophrenia-spectrum).

This hypothesis was tested by examining significant findings from t-tests conducted in step four of the statistical analyses to determine potential differences in overall PTSD scores by diagnosis. Results suggested that clients with MMDs reported significantly higher rates of PTSD symptoms than people with SSDs [t (284) = -4.56, p < .01] which provided support for this hypothesis. As would be expected based on relevant DSM criteria, clients with MMDs reported significantly more symptoms of depression than clients with SSDs [*t* (286) = -3.78, *p* < .01]. Similarly, clients with SSDs reported more symptoms of psychosis [*t* (288) = 2.97, *p* < .01].

Hypothesis 9: The number of lifetime traumatic events will be positively and significantly associated with PTSD symptoms. This hypothesis was tested by examining the Pearson's correlation between lifetime traumatic events and PTSD symptoms to determine if the relationship is statistically significant. This hypothesis was supported in that the number of lifetime traumatic events was positively and significantly associated with PTSD symptoms (*r* = .384, *p* < .01). In examining items from the PTCI, moderate positive and significant associations were found between appraisals of *self* and *world* (*r* = .565, *p* < .01), *self* and *self-blame* (*r* = .395, *p* < .01) and *world* and *self-blame* (*r* = .316, *p* < .01). Positive and significant associations with PTSD symptoms were found for all three PTCI subscales—*self* (*r* = .591, *p* < .01), *world* (*r* = .493, *p* < .01), and *self-blame* (*r* = .335, *p* < .01).

Hypothesis 10: Abbreviated scales used as proxy measures for 3 types of negative appraisal and PTSD symptoms will demonstrate adequate to good reliability and validity when utilized in routine clinical practice with SMI clients. This hypothesis was tested by examining the relevant Cronbach's alphas produced for the brief PTSD scale and the three subcales of the brief PTCI to determine reliability. As presented in Table 6, the alphas for the brief PTSD scale and the brief version of the PTCI demonstrated adequate to good reliability in support of this

hypothesis. The alpha for the 3-item PTSD scale was .81. Alphas for the three PTCI subscales were: .83 (self); .83 (world); and .87 (self blame). Concurrent validity for the brief PTSD scale was demonstrated by correlating the three items with the full 17-item scale ($r = .93$, $p < .01$) during the development of this study. Concurrent validity for brief version of the PTCI was tested by correlating the three subscales (*self, world, self-blame*) with lifetime trauma and PTSD symptoms all of which were found to be significant at $p < .01$ as presented in Table 8.

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CHAPTER SIX

Discussion

"What people think, believe, and feel affects how they behave. The natural and extrinsic effects of their actions, in turn, partly determine their thought patterns and affective reactions."

Albert Bandura, *Social Foundations of Thought and Action*, (1986, p. 25)

Summary of Findings

The major purpose of this study was to examine the relationship between negative appraisal and PTSD symptoms among a trauma-exposed sample of community support clients diagnosed with SMI. It was hypothesized that negative appraisal would have a positive and significant association with traumatic stress symptoms in a clinical sample diagnosed with major mood and schizophrenia-spectrum disorders when controlling for gender, total lifetime trauma, symptoms of depression and psychosis, and alcohol / other drug use.

Main hypotheses

Based on the regression analyses, the study findings supported all four main hypotheses, with overall negative appraisals and appraisals of the *self* being most strongly associated with PTSD symptoms. These findings are consistent with previous studies that examined negative appraisals of trauma in clients with SMI. Of the key independent variables in the PTCI, overall negative appraisal (total PTCI score used for Hypothesis 4) had the strongest association explaining 11% of the unique variance in PTSD symptoms, more than twice the explanatory power of the second strongest predictor variable, depression, which accounted for only 5%.

Although psychosis was significant as a predictor variable in the first step of all four regression models, once the key appraisal was introduced in the second step, psychosis became non-significant in all four models. Within and across all four regression models, alcohol and other drugs (AOD) was non-significant as a predictor variable.

In comparing the three types of appraisal, *self* clearly emerged as more robust than *world* or *self-blame*. The amount of unique variance in PTSD symptoms explained by negative *self* appraisal was 10% exceeding the explanatory power of all other individual factors in the first regression model. For *world/others* (Hypothesis 2), the amount of unique variance in PTSD symptoms explained was 4% exceeding all other predictor variables in the model except for depression which accounted for 8% of the variance. Negative appraisals related to *self-blame* (Hypothesis 3) also were found to have a positive and significant association with PTSD symptoms. However, the association was not as strong as appraisals related to *self* and *world*, explaining only 3% of the unique variance in PTSD symptoms. *Self-blame* had greater explanatory power in Model 2 than the other predictor variables with the exception of depression which accounted for 8% of the variance and lifetime trauma at 4%.

As previously noted, problems related to alcohol and other drug use did not appear to be influential in any of the regression models when used as control variable. This may in part be due to measurement issues in that the AOD subscale of the Basis 24 asked only about the previous seven days. Also notable is the fact that the AOD subscale does not address consumption or frequency of use. There also is the likelihood of underreporting of AOD-related problems by the clients in the study.

Lifetime trauma

The *unexpected death of a close friend, family member, or loved one* was the most frequently cited event in the sample, endorsed by 84.5% (n = 246) of the clients. This was followed by *physical abuse* with 56.4% (n = 164) reporting at least one lifetime episode. Approximately one-third of the sample (32.7% or n = 95) reported being physically abused an estimated six or more times during their lifetimes. Being *homeless for more than a day* (46.7%, n

= 136), *life threatening injury or illness* (41.6%, n = 121), *sexual abuse* (40.9%, n = 119) and *saw another person seriously harmed or killed in combat, home, or crime situation* (34.7%, n = 101). The most distressing traumatic events or index traumas for this sample included *sudden death of a close friend, family member, or loved one* (36.8%, n = 107), *sexual abuse* (16.2%, n = 47), *other* (12.7%, n = 37) and *physical abuse* (10.7%, n = 31).

Significant differences by gender

In partial support of Hypothesis 5, an independent samples t-test demonstrated that females reported significantly more negative appraisals about the world; in other words, they were more likely to endorse beliefs about others' intent to harm them or not being what they seem. No significant gender differences were found for negative appraisals regarding the self or self-blame. For overall appraisal, females reported significantly more trauma-related appraisals (higher total PTCI score) than males. In support of Hypothesis 6, females reported significantly higher rates of PTSD symptoms than men as well as significantly more lifetime trauma and depressive symptoms. However, it should be noted that based on Chi- square analyses women were significantly more likely to be diagnosed with a major mood disorder (MMD) than males who were significantly more likely to be diagnosed with a schizophrenia-spectrum disorder . In this sample, 103 females (66.9%) had a diagnosis of a MMD as compared with 51 males or 33.1%. By contrast, 76 males (56.7%) had a SSD diagnosis as compared with 58 females or 43.3%.

Significant differences by diagnosis

Several significant differences in types of appraisal (*self, world, self-blame*) and overall appraisal (PTCI total) were found in comparing clients by Axis I primary diagnosis. Clients with MMDs reported significantly more negative appraisals regarding the *self* and the *world* than

people with SSDs. However, no differences by diagnosis were found on appraisals of *self-blame*. For overall appraisal, clients diagnosed with MMDs reported significantly more trauma-related appraisal (higher PTCI scores) than clients with SSDs. Clients with MMDs also reported significantly higher rates of PTSD symptoms than people with SSDs. As would be expected based on relevant DSM criteria, clients with MMDs reported significantly more symptoms of depression than clients with SSDs and clients with SSDs reported more symptoms of psychosis.

Other notable associations

Based on results in the correlation matrix, the number of lifetime traumatic events was positively and significantly associated with PTSD symptoms. In examining items from the PTCI, moderate positive and significant associations were found between appraisals of *self* and *world*, *self* and *self-blame*, and *world* and *self-blame*. Positive and significant associations with PTSD symptoms were found for all three PTCI subscales. Total lifetime trauma estimates was found to have a positive and significant association with all key variables with the exception of psychosis, the only non-significant relationship in the correlation analysis.

Strengths and Limitations

The current study had several strengths that improved upon previous research. First, the sample size (n = 291) was notably larger than previous studies. Previous studies were hindered by small, convenience samples with limited statistical power and high refusal rates among eligible study participants. Even the strongest prospective study using a sample of clients with mixed SMI diagnoses—the RCT conducted by Mueser et al. (2008)—had only 15% with schizophrenia-spectrum diagnoses that did not permit comparisons across or within primary disorders. As noted in the Methodology chapter, data from the current study were drawn from a pilot sample of 387 with a target of 400 achieving a 97% participation rate. The sample is diverse

in that it drew clients from three distinct geographical locations, one an urban center with a multi-ethnic population. Given that these cases were selected consecutively based on the anniversary of their admission dates—with little or no potential for sampling bias—this sample can be considered representative of all clients enrolled in these programs within the three participating CMHCs.

The composition of the study sample with respect to primary Axis I diagnosis (52.9% major mood, n = 154, and 47.1% schizophrenia spectrum disorders, n = 137) allowed for comparisons between these two groups with some notable differences found in the study results.

The sample also had a fairly equal number of males and females (55.3% female and 43.6% males) allowing for comparisons of negative appraisal by gender. Use of the Basis 24 allowed for control of key factors—depression, psychosis, alcohol / other drug use—that might influence negative appraisal of past traumatic events. Finally, the two brief instruments developed for the pilot study (brief versions of the PSS-I and the PTCI) performed well in terms of reliability and validity, and, practically speaking, accommodated the time constraints imposed by the relatively short duration of a typical clinical interview.

Several study limitations should also be noted. The cross-sectional design limits any causal inferences with respect to how appraisal might be linked to PTSD symptoms. There is a possibility that clients experiencing the most severe trauma-related symptoms and appraisals did not respond to aspects of the questionnaire used in the structured interview. Missing data also may have resulted from the assigned practitioner's assessment that a particular client was not sufficiently stable or willing to answer questions regarding trauma history and related appraisals. This protocol was a necessary safeguard in the pilot study with the aim of reducing the risk of

client distress from being asked potentially sensitive questions about their trauma histories and related appraisals.

Non-significance of AOD as a control variable in all four regression analyses as being associated with PTSD symptoms raises the distinct possibility that clients underreported problems related to alcohol and other drug use. Also, the AOD subscale of the Basic 24 only considered the past seven days as the time frame which may have minimized reporting of problems related to substance use. The brief list of identified stressful/traumatic events only examined lifetime prevalence and did not ask client or practitioner to identify the age at which the reported event occurred. This additional data would have been helpful in establishing key temporal relationships that differentiated between events that happened in childhood and adolescence prior to the onset of SMI with more recent ones occurring in adulthood. As will be discussed further under 'theoretical implications,' a number of clients in the study identified traumatic stressors as the index trauma that do not conform to DSM criteria for PTSD.

This study also relied on the chart diagnosis by the assigned psychiatrist rather than one derived from a standardized interview schedule (e.g. Structured Clinical Interview for DSM IV) that would have permitted independent verification. This is due to the naturalistic nature of the pilot study conducted as part of routine practice. Although the trauma items were selected based on previous studies of SMI based on prevalence rates, another limitation is that only a brief, six-item inventory was used to obtain a trauma history. Clearly, the use of a more comprehensive and standardized measure for obtaining a trauma history (e.g. the THQ or Trauma History Questionnaire) would have strengthened this study. The use of partial or abbreviated scales to measure PTSD symptoms and negative appraisals is also a potential drawback. Use of the full scales would have permitted more fine-grained analyses of the three types of appraisals and also

could have established the rate of PTSD diagnosis for the sample. Finally, the fact that PTSD and Major Depression share common symptoms based on DSM criteria makes it difficult to distinguish the effects of one diagnosis from the other.

Theoretical Implications

Findings from the current study lend support to Ehlers and Clark's (2000) contention that negative trauma-related appraisals are associated with PTSD symptoms. In this sample, the control variable of depression was significantly associated with PTSD symptoms, exceeding negative appraisal in two of the regression models. It is possible that individuals who are more predisposed to depression may have a greater tendency to develop classic PTSD symptoms as mediated by negative appraisals related to trauma. For example, in the "cognitive triad" model posited by Beck (1972), individuals were more prone to depression if they maintained negative beliefs about themselves, the world, and the future. Ehlers and Clark's model (2000) extended this to PTSD with an emphasis on how maladaptive appraisal processes produce a sense of ongoing threat. In considering the significant differences found between SSDs versus MMDs, it raises the possibility that in persons with schizophrenia-spectrum disorders, past traumatic experiences may be overlooked or disregarded as psychotic disturbances by treatment providers who see no apparent link to actual events with attributions of reported and observed symptoms relegated to what is considered as the "primary" disorder (e.g. paranoid schizophrenia).

Implications for Criterion A1 for PTSD

Being homeless for more than one day was cited by 6.9% or 20 clients in the study sample as the index trauma deemed most traumatic. The decision was made to retain homelessness in the analyses despite the fact it deviates from Criterion A1 for a PTSD diagnosis. In addition, 12.7% (n = 37) clients cited events other than those included in the questionnaire that

they considered to be their most traumatic in the “other” category. Most of these events identified also deviated from Criterion A1which specifies “direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one’s physical integrity; or witnessing an event that involves death, injury, or a threat of the physical integrity of the person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member.”

Eight clients in the current study cited deaths among close family members that were not sudden or unexpected. Other examples included incarceration of husband or father, loss or surrender of parental rights to their minor children, being removed from mother’s custody by child welfare officials, being placed in an orphanage after parental divorce, and dealing with an emotionally-abusive relationship. One client reported moving to the United States as the most traumatic event. Another client cited “my daughter being molested.”

Several clients reported that being diagnosed with a major mental illness such as schizophrenia, or struggling with specific types of psychiatric symptoms were their most traumatic events. One respondent identified the most traumatic event as “having a panic attack and thought it was a heart attack.” Other types of stressors related to SMI that clients considered traumatic included involuntary hospitalizations (e.g. two cited the loss of pets subsequent to being in the hospital) and suicide attempts. This lends credence to findings from Jackson et al. (2004) and Chisolm, Freeman and Cooke (2006) that focused on the experience of psychosis as the proxy for a Criterion A1 event.

The findings of this study illustrate the ambiguity in defining what constitutes "traumatic events" in both severity and in kind (Shalev, 1996; Mueser et al. 2002). The distinction between a stressful and a traumatic event is not always clear cut and subject to individual appraisals that

may evoke intense fear or helplessness even in the absence of real threat such as suicide attempts or involuntary commitment over which a client may feel little control. Certainly, these events can be traumatizing, or, perhaps, re-traumatizing if one can infer that some other traumatic event (e.g., childhood sexual abuse) in some phenomenological respect is being re-experienced.

The vexing issue of whether or not to broaden DSM Criterion A1 and A2 for PTSD has particular relevance for individuals with SMI who not only experience greater trauma exposure—with the resulting cumulative effects—than the general population, but also must contend with specific cognitive vulnerabilities that may predispose them to more negative appraisals of traumatic and other stressful events throughout their lives.

There are obvious challenges in establishing valid diagnostic criteria for stress-related disorders, but when one considers the influential role of cognitive factors in post-trauma adaptation, it may be even more critical to consider how an individual perceives or subjectively appraises such events that he or she considers traumatic. As Powers & Dalgleish (2008) argue: "Although such attempts [at classification] are useful, we suggest that it is the impact of the event or events on an individual's current models of self, world, and other that is central. For some, this might indeed be the life-threatening car crash or the tour or duty in Vietnam; for others, however, being shouted at by their previously calm and supportive boss at work might be sufficient" (pg. 201). The late Richard Lazarus (1999) made a similar point when he proposed a relational approach to understanding differential responses to traumatic stress, noting that current PTSD criteria are conceptually problematic in "exaggerating the role of the traumatic environmental condition at the expense of the individual's vulnerability, an approach clearly motivated by the desire not to blame victims and to avoid the excessive focus on the failings of the person" (p. 157). Consensus on Criterion A is highly unlikely given the intensity of the

competing viewpoints and the empirical research to date that appears to support the case for an expanded definition. The cognitive theories that provided the foundation this research study are disorder specific, attempting to explain how PTSD develops and is maintained (e.g. Ehlers & Clark, 2000; Foa & Rothbaum, 1998).

Theories focused exclusively on posttraumatic stress adaptation may be too parsimonious to explain the bi-directional relationship between trauma exposure and specific types of serious mental disorders, and how cognitive factors such as appraisal mediate more adverse outcomes, including PTSD. Other theorists have proposed a more integrated approach, acknowledging the potential for shared etiology and potential cognitive vulnerabilities across disorders (e.g. Power & Dalgleish, 2008; Riskind & Alloy, 2006). With further testing and refinement, integrated theories may be more useful in explaining co-morbidity of PTSD and other forms of psychopathology, including mood and schizophrenia spectrum disorders. Integrated approaches might be particularly useful for bridging the gap between the stress-coping and traumatic stress literatures. It is especially important to understand potential interactions and the cumulative effects of stress all along the continuum ranging from chronic daily hassles to life-threatening traumatic events that are all subject to individual appraisals of perceived threat and level of personal control. For example, given that ordinary death-related losses are for most people an inevitable part of life, it's also critical from a theoretical standpoint, to ascertain how individuals with SMI deal with grief and bereavement over the lifespan and how these losses affect their overall psychological functioning.

Future Research Directions

One question that arises in light of the current study findings is why people diagnosed with SSDs report not only less negative appraisal overall than people with MMDs but also lower

rates of lifetime trauma exposure. Longitudinal empirical testing of unique causal pathways for trauma and PTSD in individuals with schizophrenia-spectrum disorders versus mood disorders has yet to be conducted. However, this may be a fruitful avenue for future investigation. Hypothesis testing using prospective designs and larger probability samples could examine the relationship among specific types of trauma, related appraisals, and specific symptoms (e.g. psychosis, depression) to determine the strength and direction of these associations. It is possible that individuals who are more predisposed to depression may have a greater tendency to develop classic PTSD symptoms as mediated by negative appraisals related to trauma. On the other hand, the particular cognitive vulnerabilities characteristic of SSDs may interfere with the encoding, storage, and retrieval of trauma-related memories—particularly during psychotic episodes—which in turn may impede an individual's capacity to emotionally process those experiences and articulate them in a meaningful way to others. This point was made in interpreting findings from Jackson et al. (2004), a study that compared coping styles among people who had experienced a first episode psychosis with 'sealers' reporting more avoidance symptoms than 'integrators.' The authors speculated that 'sealers' may have greater difficulty accessing memories of their psychotic episodes as posited by McGlashan (1987). In a similar vein, the Traumagenic Neurodevelopmental Model (Read, Perry, Moskowitz & Connolly, 2001) proposes that stress and trauma occurring early in life to people already predisposed to schizophrenia may have an adverse impact on the developing brain resulting in significant structural changes that impair learning and memory. The blunted affective responses often associated with the negative symptoms of schizophrenia also may inhibit emotional processing and related appraisals of stressful and traumatic events. Thus, more research is needed to examine the direct and indirect effects of traumatic stress on people with schizophrenia-spectrum disorders. Although psychosis

was not as robust as other predictor variables in the present study findings, there is still the possibility that people with SSDs may be more likely to experience psychotic symptoms in the aftermath of trauma. Some investigators have suggested that trauma-related psychosis may represent a form of re-experiencing (Read, Agar, Argyle & Aderhold, 2003). Accordingly, conventional instruments used to assess PTSD symptoms may not be adequate for assessing the effects of traumatic stress in these individuals.

Although negative appraisals of *world* were higher in people with mood disorders in this study, Calvert, Larkin and Jellicoe-Jones (2008) demonstrated potential associations between negative trauma-related cognitions and delusional ideation including paranoia. However, the possibility that trauma-related stress may be expressed differently in people with schizophrenia-spectrum disorders and may even perhaps encourage the onset of illness (Morrison et al., 2003) deserves future consideration. For individuals with histories of psychotic disturbances, the re-experiencing symptoms characteristic of PTSD (e.g. flashbacks, nightmares) may be more likely to manifest as positive symptoms such as hallucinations or delusions. Similarly, paranoia may result from extreme hypervigilance or dissociation linked to traumatic stress. Given these findings, it may be advantageous to examine the content of persecutory delusions to determine if appraisals of ongoing threat are associated with PTSD symptoms using larger samples with longitudinal designs that control for temporal issues such as onset of illness, cumulative trauma exposure and other individual variables , including medication adherence and overall cognitive and social functioning.

Future studies with SMI might also attempt to link various types of appraisal to specific negative emotions, such as anger, sadness, fear, and guilt. This may increase our understanding of how self-blame or guilt underlies more severe affective responses to traumatic events

(Crisford et al., 2008) that guilt may impede emotional processing of traumatic events in SMI clients. This finding has potential relevance for treatment. For example, a recent study by Owens, Chard and Cox (2008) examined guilt cognitions in a sample of 99 veterans (80% males) who underwent of cognitive processing therapy. Although the study findings demonstrated that CBT significantly reduced PTSD and depressive symptoms, as well as negative beliefs associated with self-criticism, self-blame, helplessness, and hopelessness, guilt-related cognitions appeared to be less responsive to treatment. This finding merits attention in future studies of PTSD in SMI clients.

As stated earlier, our current understanding of the appraisal mechanisms underlying PTSD and SMI is hindered by a preponderance of cross-sectional rather than longitudinal data which precludes an examination of the temporal relationships among trauma, PTSD, and SMI symptoms over the lifespan. Future prospective designs need to distinguish distal (e.g. history of childhood abuse) versus proximal factors (e.g. social support, use of psychoactive substances to cope with symptoms) that may influence appraisals in posttraumatic adaptation. Continued research focused on factors associated with an increased risk of PTSD must continue if more effective prevention and treatment interventions are to be developed.

A major methodological challenge lies in acknowledging that appraisals and emotions are not strictly private processes—they tend to be socially-shared phenomena. This interaction has implications on both an individual as well as a group level (Guay et al., 2006). Feedback—both negative and positive—from one's social network presents an individual with an opportunity to reappraise his or her circumstances. This may have particular relevance to SMI clients, especially those with schizophrenia, who tend to have smaller support networks than non-SMI individuals (Mueser et al., 2002). As noted in the introduction chapter, a persistent cultural

stigma that views individuals with mental illness as dangerous or otherwise socially aberrant may contribute to a sense of powerlessness, social alienation, and increased life stress for people with SMI (Corrigan, 2004) perhaps conferring greater vulnerability to negative effects from traumatic stress. Thus, future research designs could test the potential mediating effects of social support and perceived social stigma on trauma-related appraisals in SMI individuals.

Implications for Practice and Policy

Service provision for SMI clients in forensic, inpatient, and community settings should include an extensive trauma history—included identification of problematic appraisals—that may warrant specialized treatment. Based on findings from Lommen and Restifo (2009), there is potential for trauma and PTSD to be overlooked in the SMI population. Social workers and case managers who work with individuals diagnosed with SMI are in a key position to identify trauma-related problems and help clients develop more positive coping strategies to alter negative appraisals and decrease emotional distress (Sherrer & O'Hare, 2008).

Two controlled treatment studies included here (Mueser et al., 2007, 2008) indicate the potential for modifying maladaptive appraisals using a cognitive restructuring approach adapted for SMI clients. Findings from both of these intervention studies demonstrate that reductions in negative appraisal mediated changes in PTSD symptoms. Examining underlying trauma-related appraisals about external events and encouraging the formulation of more realistic judgments to replace distorted beliefs may be beneficial in reducing emotional distress and associated symptoms of PTSD and SMI. For example, it would be advisable for practitioners to explore negative appraisals associated with bereavement of loved one with their clients especially if recent losses seem to have some connection to past traumas that may exacerbate or maintain PTSD symptoms.

Based on study findings, females may be more likely than males to endorse appraisals regarding the harmful intentions of others; such appraisals should be considered within the treatment context especially in working with women with SMI who have histories of childhood sexual abuse and other forms of interpersonal violence (Goodman et al., 1997).

Social workers and other practitioners working with SMI clients should consider the idiosyncrasies of delusions and target appraisals associated with guilt, self-blame, and perceived threat. SMI clients who feel more helpless and less in control during their psychotic episodes and perceive lower levels of social support may be at greater risk for trauma-related symptoms. In treating first-episode psychosis, it may be especially beneficial to consider subjective thoughts and feelings of threat and helplessness associated with the experience of psychosis and associated stimuli, including negative appraisals of involuntary treatment. Finally, assisting clients in preparing for potential relapse may increase subjective sense of control in future psychotic episodes (Chisholm et al., 2006; Mueser & Rosenberg, 2003).

In conclusion, the findings from this study underscore the importance of deepening our knowledge of how trauma-exposed individuals construct meaning through appraisal, and how such idiosyncratic cognitive processes—and inherent vulnerabilities associated with typical SMI symptoms of psychosis and depression—may mediate PTSD or otherwise contribute to deleterious consequences in highly vulnerable populations.

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"There are only two mistakes one can make along the road to truth; not going all the way, and not starting."

-Buddha

Table 2: Summary of Core Studeies Addressing Appraisal and Trauma in SMI

STUDY & DESIGN	AIMS /HYPOTHESES	SAMPLE	MEASURES (appraisal in bold)	MAIN FINDINGS
Jackson et al. (2004) UK Cross-sectional Structured interview	Establish prevalence of traumatic symptoms in a sample of people with first episode psychosis Test the link between the admission experience & PTSD symptoms Test whether symptoms following admission are mediated by coping style & appraisal	35/50 patients interviewed 18 months post first episode psychosis (FEP) FEP proxy for Criterion A event 26 males (74%) 9 females Mean age: 25.8	PTSD Scale (McGorry et al.1991) **Impact of Event Scale** (IES; Horowitz, 1979) Hospital Anxiety & Depression Scale (Zigmund & Snaith, 1983) **Hospital Experiences Questionnaire** (McGorry, 1991) Recovery Style Questionnaire (RHQ; Drayton et al. 1998) Psychiatric Assessment Scale (Krawiecka et al., 1977)	-High level of intrusion & avoidance for entire sample -IES scores high for entire sample, significantly higher in those meeting PTSD criteria -31% of sample met PTSD criteria **-Participants with PTSD appraised stressfulness of admissions ward significantly higher than those without PTSD** -77% total sample described FEP as "extremely stressful" -Coping style: 'sealers' reported more avoidance & less frequent intrusions than 'integrators' -Limitations: small convenience sample; possibility refusers had more severe symptoms
Kilcommons & Morrison (2005) UK Cross-sectional Combination structured interview & self- report	H1:Severity of trauma will be associated with severity of psychotic symptoms H2:Trauma will be associated with PTSD symptoms H3:Negative beliefs / dissociative response to trauma will be associated with psychotic experiences	32 participants 25 males (72%) Mean age=35 Convenience sample of community mental health clients all meeting criteria for schizophrenia	Trauma History Questionnaire (THQ; Green, 1996) Positive & Negative Syndrome Scale (PANSS;Kay & Opler, 1987) PTSD Scale (Foa et al., 1993) **Posttraumatic Cognitions Inventory (PTCI; Foa et al. 1999)** Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986)	-94% report trauma exposure -Overall no gender difference in reported lifetime trauma -Females reported more CSA than males; No gender difference for lifetime physical assault -Prevalence PTSD: 53.1% -Total lifetime trauma positively & significantly associated with delusions, hallucinations, and PTSD symptoms; **-Hallucinations positively correlated with negative cognitions about the self and the world, amnesic dissociation & depersonalization** **-Negative appraisals resulting from trauma might confer vulnerability to psychosis** -Limitations: small convenience sample, reliance on self-report
Crisford, Dare & Evangeli (2008) UK Cross-sectional Structured interview & chart review	To test relationship between offense-related guilt cognitions & PTSD symptoms in SMI offenders Use of criminal offense as Criterion A event noteworthy	Forensic sample 53/91 58% agreed to participate; final sample n=45 all but 2 are males; all committed a violent or sexual offense; all admitting guilt All in sample diagnosed with SMI including schizophrenia, bipolar, and /or AXIS II personality 24.4% had a personality disorder 28/45 (62.2% non-white)	Quick Test (QT; Ammons & Ammons, 1962) Detailed Assessment of Posttraumatic Stress (DAPS; Briere, 2001) **Trauma-related Guilt Inventory (TRGI; Kubany, 2004)** Revised Gudjonsson Blame Attribution Inventory (Gudjonsson & Singh, 1989) Positive and Negative Affect Scale (PANAS; Watson, Clark & Tellegen, 1988)	-18 met criteria for "offense-related" PTSD (40%) **-Guilt cognitions correlate significantly with PTSD symptoms** -Regression modeling demonstrated that guilt-related cognitions significant in predicting PTSD symptoms when controlling for other factors including psychiatric symptoms -Limitations: small sample size, limited statistical power

STUDY & DESIGN	AIMS/HYPOTHESES	SAMPLE	MEASURES (appraisal in bold)	MAIN FINDINGS
Chisolm, Freeman & Cooke (2006) UK Cross-sectional Self-report questionnaire	To investigate potential predictors of traumatic stress in response to a psychotic episode H1: Approx 1/3-1/2 of individuals who have recently experienced an acute, non-affective psychotic episode will score sufficiently higher on the IES in relation to the psychotic episode to indicate criteria for PTSD H2: Traumatic stress sx will be associated with prior trauma, greater perceptions of helplessness and lack of control, absence of crisis support H3:People experiencing FEP will have significantly fewer PTSD reactions assoc. with psychotic episode than multiple psychotic episodes H4: Trauma reactions will be higher with persecutory delusions compared with other types of delusions H5: Content of persecutory delusions (e.g. power of the persecutor) will be associated with traumatic reactions	N=36, mean age 34 yrs 21 male, 15 female 75% White European Recruited from adult mental health services in London, UK ICD criteria for diagnosis of schizophrenia or related disorder of non-affective functional psychosis given by psychiatrist Inclusion criteria-experienced psychiatric admission in the last 12 months but had been discharged due to remission of symptoms Excluded: patients in the acute stages of illness as judged by clinical teams, a primary diagnosis of affective psychosis or insufficient command of English to complete self report questionnaires All in sample had experienced delusions at time of hospital admission with 19 reporting persecutory delusions	Self-report with exception of Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1998) conducted by interviewer **IES** **Perception of Helplessness Questionnaire (PHQ;** Joseph et al. 1994); examines beliefs during the index event, e.g. "I felt helpless," "I felt paralyzed with fear." Crisis Support Scale (CSS; Joseph et al., 1992) **Perceived Control Questionnaire (PCQ)** Devised for study consisting of 4 statements about perceived uncontrollability during the psychotic episode (strongly agree-strongly disagree) e.g. 'I felt in control of myself.' Stressful Life Events Screening (SLES; Stamm et al., 1996) to assess trauma history with a list of 20 adverse events	-Associations tested with Pearson's correlations & multiple linear regression analysis H1: High level of acute traumatic stress reported -Overall, 61.1% were found to have moderate to severe PTSD symptoms (N=22) N=5 (13.9%) subclinical N=9 (25%) mild N=14 (38.9%) moderate N=8 (22.2%) severe H2:IES scores were correlated with BPRS & found to be non-significant Higher levels of helplessness & previous trauma and lower levels of control and crisis support were all significantly associated with higher level of PTSD symptoms H3:People with FEP scored lower on the IES than the relapse group H4: Not supported **H5: Higher levels of PTSD symptoms significantly assoc. with higher perceptions of power of the persecutor, greater ratings of the awfulness of the threat, inability to cope, thinking the persecution to be deserved, & lower ratings of control over the situation** **-Perceptions of being more helpless and in less control suggested poorer adaptation** **-Content of persecutory delusions- data suggests increased perception of threat boosted IEP scores** **-PTSD symptoms associated with judgments of "awfulness of the threat."** -Limitations: small convenience sample, reliance on self-report data; limited statistical power
Ford & Fournier (2007) USA Cross-sectional Structured interview	H1: Trauma exposure will be reported by 90% or greater of the sample of SMI women with more than 50% reporting hx of multiple traumas in childhood & adulthood H2: Predicts that 25-45% will meet criteria for PTSD H3: Trauma & PTSD will correlate with poorer physical & mental health; increased substance use; shame, self-loathing, & loss of sustaining beliefs	35 low-income women with SMI (schizophrenia, schizoaffective, and bipolar disorders, major depression with psychotic features, psychotic disorder NOS. Multi-ethnic (mean age 41) from an urban CMHC, all with histories of multiple psych inpatient admissions African Amer N=17 (48%) Hispanic N=5 (14%) Caucasian N=13 (38%)	-Traumatic Events Screening Inventory (TESI; Goodman et al.1998) CAPS; BPRS;SF-12 (Ware et al., 1996) -Alcohol, Smoking & Substance Involvement Screening Test (ASSIST; Newcombe et al. 2005) **-Structured Interview for Disorders of Extreme Stress (Pelcovitz et al., 1997)** (items on shame, self-loathing, loss of sustaining beliefs)	**-Negative self-perceptions (e.g. viewing oneself as damaged & powerless) positively and significantly associated with PTSD diagnosis** -100% report at least 1 traumatic event (H1) -98% (all but one) reported multiple traumas -Current PTSD 44% -Lifetime PTSD 53% (H2) -Those with PTSD were more likely (94%) than those without PTSD (50%) to report using two or more substances **-PTSD sig. associated with negative self-perceptions, alienation, and loss of sustaining beliefs** -Limitations: small sample of self-selected female clients; low statistical power with increased probability of Type 1 error

STUDY & DESIGN	AIMS/HYPOTHESES	SAMPLE	MEASURES (appraisal in bold)	MAIN FINDINGS
Calvert, Larkin & Jellicoe-Jones (2008) UK Cross-sectional Self-report questionnaire	H1: Intensity of trauma will correlate with intensity of delusional ideation; H2: Negative beliefs about the self, self-blame and negative beliefs about the world will be associated with paranoia & delusional ideation	34/108 (31% response rate) Forensic sample of 30 males 4 females all diagnosed with schizophrenia Mean age 35 All referred by treatment teams; no analysis done to compare with refusers	Worst Memories Scale (Bowe, Morrison & Morley, 2002) Davidson Trauma Scale (DTS; Davidson et al., 1997) **PTCI** Peters Delusion Inventory (PDI-21; Peters, Joseph & Garety, 1999) Paranoia Scale (PS; Fenigstein & Vanable, 1992)	-All reported at least one traumatic event (mean=4) 13 (38%) scored 40 or higher on DTS indicating likely PTSD **-Negative cognitions about the self had + and significant correlation with PDI distress (r=.610, p<.01) and PDI preoccupation (r=.496, p <.01)** **-Negative cognitions about the world + and significantly correlated with paranoia (r=.624, p <.01); Self-blame non-significant** **-Findings suggest that SMI patients with negative cognitions about the self experienced high levels of distress from their delusions and were highly preoccupied with them.** **-Patients with negative cognitions about the world had high levels of paranoia.** -Limitations: small sample size restricted statistical analysis; highly selective sample with two-thirds refusing; reliance on self-report
Mueser, et al. (2008) USA Randomized controlled trial of CBT tailored for SMI clients with PTSD Structured interviews at baseline, 6 months; also 3 & 6 months post treatment	H1: CBT will be more effective in reducing PTSD symptoms & negative trauma related cognitions than treatment as usual (TAU) H2: CBT will be more effective than TAU in reducing non-PTSD psychiatric symptoms	SMI diagnosis, 18 and older Achieved sample of 108 community mental health clients (21% male) with current diagnosis of PTSD Trial of individual intervention using psycho-education, stress reduction, coping skills & cognitive restructuring	Structured Clinical Interview for DSM-IV (SCID-I; First et al., 1996) Clinician Administered PTSD Scale (CAPS; Blake et al., 1995) BPRS THQ **PTCI** Beck Depression (BDI II; Beck et al., 1996) Beck Anxiety Inventory (BAI; Beck & Steer, 1990)	-CBT superior to TAU in reducing PTSD symptoms and trauma-related cognitions -CBT superior in reducing depression, anxiety, and other psychiatric symptoms **-Specific meditation analysis was conducted suggesting PTSD symptoms were reduced as a result of a reduction in negative trauma-related beliefs** **-Effectiveness of CBT mediated by trauma-related beliefs which were highly and significantly correlated with PTSD symptoms** -Limitations: functional outcomes not assessed; heterogeneous sample of mixed diagnoses with only 15% schizophrenia; possible confound of medication adjustments during study period
Mueser et al. (2007) USA Pilot study of group intervention for PTSD in SMI (uncontrolled) Structured interviews pre and post-assessment	H1:SMI clients will be engaged and retained in group therapy for PTSD H2: Group treatment will reduce PTSD symptoms and trauma-related beliefs	80 SMI clients (99% white, 79% female); 80 assessed at baseline & 41 provided follow-up data Group intervention (21 weeks) using psycho-education, stress reduction, coping skills & cognitive restructuring	THQ PTSD Checklist (PCL; Blanchard et al., 1996) **PTCI** BDI	59% of clients completed group treatment protocol -Treatment completers had significantly fewer negative trauma-related cognitions -Treatment completers significantly improved in PTSD-related symptoms -No symptom differences between completers and drop-outs **-Significant changes in PTSD symptoms after cognitive restructuring suggest negative cognitions may mediate changes in PTSD** -Limitations: uncontrolled treatment study with a small sample only one-third male; possible confounds of psychiatric diagnosis and medication

STUDY & DESIGN	AIMS/HYPOTHESES	SAMPLE	MEASURES (appraisal in bold)	MAIN FINDINGS
Lommen & Restifo (2009) The Netherlands Cross-sectional Combination self-report questionnaire (items read aloud by researchers) & chart review	H1: Prevalence rates of lifetime traumatic events will be higher in this sample as compared with general population H2: Reported lifetime trauma will be higher when measured with self-report questionnaire as opposed to chart review H3: PTSD prevalence will be higher in sample as compared with general population H4: PTSD rates will be higher using self-report questionnaire as compared with chart review H5: PTSD symptom severity will be positively related to negative posttraumatic cognitions	33 outpatient clients diagnosed with schizophrenia (N=23) or schizoaffective disorder (N=10) recruited out of a possible 173 patients meeting diagnostic criteria 23 males Mean age = 35 (range 21-63) Exclusionary criteria: severe medical problems; florid psychotic symptoms, chaotic speech or mental retardation that hindered communication; primary therapist refusal; insufficient mastery of Dutch language	THQ-R PSS-SR **PTCI**	-97% reported at least one lifetime traumatic event, higher than general pop. (H1) with 81.8% reporting at least two, and 60.6% at least three -No gender differences found except for females reporting more unwanted sexual contact after age 16 than males in the sample -Reported lifetime trauma higher than rates obtained via chart review (H2) -Rates of PTSD higher than general pop. (H3) with rates ranging from 9.1% to 39.4%; two different scoring methods utilized yielding four different prevalence rates with separate scores with and without the need to fulfill DSM Criteria A -None of participants had a PTSD diagnosis in the medical record (H4) **-Negative cognitions about self, world, and self-blame were significantly and positively related to PTSD symptom severity (H5)** **-Total PTCI score had a stronger association with PTSD symptom severity (r = .74, P < .001) as compared with scores of individual sub-scales: *Self* (r = .67, P < .01); *World* (r = .57, P < .01); *Self blame* (r = .46, P < .01)** **-Cronbach's alphas for PTCI: .92 (entire scale); .92 (self); .74 (world); .68 (self blame)** -Limitations include small sample size, potential sampling bias with the possibility that refusers had higher rates of trauma and PTSD, reliance on chart diagnosis as opposed to structured clinical interview, and use of self-report measures

Table 3. Sample Characteristics—Demographics (N = 291)

Variable	M	SD	Frequency *f*	Percentage %
Gender				
Male	-	-	127	43.6
Female	-	-	161	55.3
Missing	-	-	3	1.0
Marital Status				
Never married	-	-	175	60.1
Married			19	6.6
Separated/Widow/Divorced	-	-	90	30.9
Missing	-	-	7	2.4
Race				
African American	-	-	34	11.7
White	-	-	206	70.8
Hispanic	-	-	24	8.2
Other	-	-	27	9.3
Age	47.3	12.4		
Education / Years	11.5	2.6		
Family Income (annual) (Median income = $9,000)	11,113	6766.89		
Hrs. Worked past 30 days (237 or 85.6% reported 0 hrs.)	8.29	27.5		
Primary Income Source				
Self	-	-	18	6.2
Relative	-	-	6	2.1
Welfare	-	-	8	2.7
SSI/SSDI			240	82.5
Other	-	-	7	2.4
Insurance				
Medicaid only	-	-	86	29.6
Medicare only	-	-	35	12.0
Medicaid + Medicare	-	-	155	53.3
Other third party	-	-	11	3.8
No insurance	-	-	18	6.2

Table 4. Sample Characteristics—Psychiatric Background (N = 291)

Variable	M	SD	Frequency *f*	Percentage %
Primary Axis I diagnosis				
Major mood disorder	-	-	154	52.9
Schizophrenia-spectrum	-	-	137	47.1
Secondary substance use disorder	-	-	89	30.6
Age of onset—mental illness	24.9	10.9	-	-
GAF score	47.6	7.6	-	-
Psychiatric hospitalization				
Ever hospitalized	-	-	274	94.2
Hospitalized past year	-	-	61	21.0
Years at CMHC	10.96	8.99	-	-
Psychotropic medications				
Taking antipsychotic meds	-	-	212	72.9
Taking antidepressant meds	-	-	215	73.9
Taking anti-anxiety meds	-	-	145	49.8
Needs prompting to take meds				
Almost never	-	-	147	50.5
25% of time	-	-	47	16.2
50% of time	-	-	23	7.9
75% of time	-	-	20	6.9
Almost always	-	-	44	15.1

Table 5. Means and standard deviations for key study items

Study sample of 291 clients (n = 127 males; n = 161 females) with a primary diagnosis of either a schizophrenia-spectrum disorder (SSD; 47.1%, *n* = 137) or a major mood disorder (MMD; 52.9%, *n* = 154) who have reported at least one lifetime traumatic event.

Variable	M	SD
-Dependent variable-		
PTSD Symptoms (3-item brief version)		
Emotionally upset when reminded of trauma (*Re-experiencing*)	1.24	1.10
Feeling distant or cut off from people since the trauma (*Avoidance*)	0.91	1.08
Trouble concentrating (*Hyperarousal*)	1.10	1.12
Variable	M	SD
-Main independent variable-		
Posttraumatic Cognitions (PTCI brief version)		
SELF		
Life destroyed by the trauma	2.72	1.52
I have no future	2.10	1.21
I have been permanently changed for the worse	2.43	1.40
WORLD		
Have to be especially careful because you never know what can happen next	3.18	1.47
People are not what they seem	3.11	1.38
You can never know who will harm you	3.20	1.43
SELF-BLAME		
Event happened because of the way I acted	2.06	1.25
There is something about me that made the event happen	2.02	1.24
Event happened to me because of the sort of person I am	2.00	1.23

Table 5. Means and standard deviations for key study items—continued

Variable	M	SD
Lifetime Traumatic Events* (Key independent variable)		
Physical abuse	4.07	4.73
Sexual abuse	2.12	3.56
Saw another harmed/killed	1.17	2.53
Unexpected death of friend/loved one	2.37	2.24
Homeless for more than a day	2.05	3.21
Life-threatening injury or illness	1.03	1.92
*Items recoded using midpoints as estimates so that 1=0, 2=1, 3=3.5, 4=8, 5=11		

Variable	n	%
Index trauma—categorical (identified by client as 'most traumatic event')		
Physical abuse	31	10.7
Sexual abuse	47	16.2
Saw another harmed/killed	16	5.5
Unexpected death friend/loved one	107	36.8
Homeless for more than a day	20	6.9
Life-threatening injury or illness	24	8.2
Other	37	12.7

Variable	M	SD
-Main control variables-		
Basis-24—depression items (subscale score range 6-30)		
Difficulty managing day to day life (item #1)	2.39	1.12
Difficulty coping with problems (item #2)	2.53	1.14
Difficulty concentrating (item #3)	2.55	1.23
Feel confident (item #9)	2.84	1.17
Feel sad or depressed (item #10)	2.58	1.15
Feel nervous (item #12)	2.70	1.24
Basis-24—psychosis (subscale score range 4-20)		
Think you had special powers (item #14)	1.30	0.79
Hear voices or see things (item #15)	1.77	1.18
Think people were watching you (item #16)	2.03	1.33
Think people were against you (item #17)	2.21	1.30
Basis-24—alcohol / other drugs (subscale score range 4-20)		
Have an urge to drink alcohol or take street drugs (item #21)	1.75	1.14
Anyone talk to you about your drinking or drug use (item #22)	1.74	1.27
Try to hide drinking or drug use (item #23)	1.23	0.72
Problems from drinking or drug use (item #24)	1.40	0.97

Table 6. Measures of Central Tendency and Cronbach's Alphas for Major Scales

Variable	M	SD	Skew	Kurtosis	Alpha
PTSD Symptoms -Dependent variable- 3-item brief version; possible score range 0-9	3.26	2.80	.48	- .89	**.81**
Posttraumatic Cognitions -Key independent variable-					
SELF Items 1-3 of PTCI brief version; possible score range 3-15	7.25	3.57	.53	- .69	**.83**
WORLD Items 4-6 of PTCI brief version; possible score range 3-15	9.49	3.69	- .33	- .89	**.83**
SELF-BLAME Items 7-9 of PTCI brief version; possible score range 3-15	6.08	3.33	.88	.01	**.87**
PTCI TOTAL All 9 items of PTCI brief version; possible score range 9-45	22.83	8.34	.13	- .43	**.86**
Basis-24 -Key control variables-					
Basis-24—Depression Items 1, 2, 3, 9, 10, 12; possible score range 6-30	15.60	5.41	.21	- .70	.86
Basis-24—Psychosis Items 14, 15, 16, 17; possible score range 4-20	7.31	3.38	.88	- .05	.70
Basis-24—Alcohol /Other Drugs Items 21, 22, 23, 24; Possible score range 4-20	6.11	3.31	1.72	2.31	.80

Reference alphas in boldface type:

Hypothesis 10 Abbreviated scales used as proxy measures for 3 types of negative appraisal and PTSD symptoms will demonstrate adequate to good reliability and validity

Table 7. Means and Standard Deviations for Major Subscales by Gender and Diagnosis*

*Schizophrenia-Spectrum Disorders (SSD) as compared with Major Mood Disorders (MMD)

Variable	Males	Females	SSD	MMD
	M / SD	M / SD	M / SD	M / SD
PTSD Symptoms 3-item brief version	2.55 / 2.73	**3.81 / 2.74****	2.49 / 2.56	**3.95 / 2.84****
Posttraumatic Cognitions				
SELF Items 1-3 of PTCI brief version; possible score range 3-15	6.79 / 3.74	7.61 / 3.42	6.53 / 3.37	**7.88 / 3.64****
WORLD Items 4-6 of PTCI brief version; possible score range 3-15	8.76 / 3.61	**10.10 / 3.66****	8.60 / 3.68	**10.28 / 3.54****
SELF-BLAME Items 7-9 of PTCI brief version; possible score range 3-15	6.13 / 3.32	6.05 / 3.36	6.03 / 3.20	6.12 / 3.45
PTCI—TOTAL All items 1-9 of PTCI brief version; possible score range 9-45	21.68 / 8.41	**23.81/ 8.24**	21.21/ 8.23	**24.27/ 8.21**
Lifetime Traumatic Events	10.89 /11.42	14.50 / 11.38**	9.22 / 9.43	16.01 / 12.23**
Basis-24				
Basis-24—Depression Items 1, 2, 3, 9, 10, 12; possible score range 6-30	14.55 / 5.08	16.35 / 5.50**	14.33 / 5.12	16.69 / 5.43**
Basis-24—Psychosis Items 14, 15, 16, 17; possible score range 4-20	7.68 / 3.69	7.03 / 3.11	7.93 / 3.65**	6.76 / 3.03
Basis-24—Alcohol /Other Drugs Items 21, 22, 23, 24; possible score range 4-20	6.39 / 3.32	5.90 / 3.33	5.79 / 3.03	6.40 / 3.53

**Significant at $p < .01$

Reference means and standard deviations in boldface type:

Hypothesis 5 There will be significant gender differences in negative appraisals of past traumatic events (*self*, *world*, *self-blame)* and overall appraisal

Hypothesis 6 There will be significant gender differences in reported rates of PTSD symptoms

Hypothesis 7 There will be significant differences in types of appraisal (*self, world, self-blame*) and overall appraisal based on Axis I primary diagnosis (mood disorders as compared with schizophrenia-spectrum)

Hypothesis 8 There will be significant differences in reported rates of PTSD symptoms based on Axis I primary diagnosis (mood disorders as compared with schizophrenia-spectrum)

Table 8. Pearson Correlation Matrix of Key Study Variables (N=291)

	1	2	3	4	5	6	7	8
1. Total Lifetime Trauma Estimates		.269**	.096	.219**	.348**	.375**	.218**	**.384****
2. B24 Depression			.450**	.261**	.486**	.394**	.227**	.529**
3. B24 Psychosis	.			.165**	.334**	.348**	.201**	.286**
4. B24 Alcohol / Other Drug					.161**	.173**	.181**	.159**
5. Negative Cognitions—Self						.565**	.395**	.591**
6. Negative Cognitions—World							.316**	.493**
7. Negative Cognitions—Self Blame								.335**
8. PTSD Symptoms								

** All correlations are significant at $p < .01$.

Reference:

Hypothesis 9 The number of lifetime traumatic events will be positively and significantly associated with PTSD symptoms (correlation .384** in column 8 noted in boldface type)

Table 9. Hierarchical Multiple Regression Model for Hypothesis 1 (N = 269)

Association of negative appraisal of *self* (key independent variable) with PTSD symptoms (dependent variable) while controlling for gender, total lifetime trauma, depression, psychosis, alcohol / other drug use

PTSD Symptom Score (dependent variable)

Step Predictor	Standardized βeta	R^2 Change	*t*	*p*	part correlation²
Model 1					
Client gender	.14		2.64*	.010	.02
Lifetime trauma	.24		4.61***	.000	.05
B24 depression	.39		6.54***	.000	.10
B24 psychosis	.11		1.98*	.049	.01
B24 AOD	-.00		- .07	.946	.00
		.36			
R^2	.36				
Adjusted R^2	.35				
F (*df* = 5/ 263)	29.44***				
Model 2					
Client gender	.12		2.61*	.010	.01
Lifetime trauma	.14		2.88**	.004	.02
B24 depression	.26		4.47***	.000	.04
B24 psychosis	.04		.84	.404	.00
B24 AOD	-.01		- .11	.915	.00
Self cognitions	.39		7.14***	.000	.10
		.10			
R^2	.46				
Adjusted R^2	.45				
F Change	50.95***				
F (*df* = 6 / 262)	37.69***				

*p < .05 **p <.01 ***p <.001

Reference:

Hypothesis 1

Trauma-related negative appraisals about the *self* will have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

Table 10. Hierarchical Multiple Regression Model for Hypothesis 2 (N = 269)

Association of negative appraisal of *world* (key independent variable) with PTSD symptoms (dependent variable) while controlling for gender, total lifetime trauma, depression, psychosis, alcohol / other drug use

PTSD Symptom Score (dependent variable)

Step Predictor	Standardized βeta	R^2 Change	*t*	*p*	part correlation²
Model 1					
Client gender	.14		2.64**	.010	.02
Lifetime trauma	.24		4.61***	.000	.05
B24 depression	.39		6.54***	.000	.10
B24 psychosis	.11		1.98*	.049	.01
B24 AOD	- .00		- .07	.946	.00
		.36			
R^2	.36				
Adjusted R^2	.35				
F (*df* = 5 / 263)	29.44***				
Model 2					
Client gender	.10		2.04*	.042	.01
Lifetime trauma	.17		3.20**	.002	.02
B24 depression	.35		5.94***	.000	.08
B24 psychosis	.04		.76	.447	.00
B24 AOD	- .01		-.29	.770	.00
World cognitions	.19		4.36***	.000	.04
		.04			
R^2	.40				
Adjusted R^2	.39				
F Change	18.97***				
F (*df* = 6/ 262)	29.37***				

*p < .05 **p <.01 ***p <.001

Reference:

Hypothesis 2

Trauma-related negative appraisals about the *world* will have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

Table 11. Hierarchical Multiple Regression Model for Hypothesis 3 (N = 268)

Association of negative appraisal of *self-blame* (key independent variable) with PTSD symptoms (dependent variable) while controlling for gender, total lifetime trauma, depression, psychosis, alcohol / other drug use

PTSD Symptom Score (dependent variable)

Step Predictor	Standardized βeta	R^2 Change	*t*	*p*	part correlation²
Model 1					
Client gender	.14		2.62**	.009	.02
Lifetime trauma	.24		4.61***	.000	.05
B24 depression	.39		6.53***	.000	.10
B24 psychosis	.11		1.98*	.049	.01
B24 AOD	- .00		- .06	.951	.00
		.36			
R^2	.36				
Adjusted R^2	.35				
F (*df* = 5 / 263)	29.35***				
Model 2					
Client gender	.14		2.80**	.005	.02
Lifetime trauma	.21		4.03***	.000	.04
B24 depression	.37		6.25***	.000	.09
B24 psychosis	.09		1.56	.122	.01
B24 AOD	- .02		- .43	.667	.00
Self-Blame	.19		3.69***	.000	.03
		.03			
R^2	.39				
Adjusted R^2	.38				
F Change	13.60***				
F (*df* = 6/261)	27.91***				

*p < .05 **p <.01 ***p <.001

Reference:

Hypothesis 3

Trauma-related negative appraisals about *self-blame* will have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

Table 12. Hierarchical Multiple Regression Model for Hypothesis 4 (N = 268)

Association of overall negative appraisal of *self, world, self-blame* (key independent variable) with PTSD symptoms (dependent variable) while controlling for gender, total lifetime trauma, depression, psychosis, alcohol / other drug use

PTSD Symptom Score (dependent variable)

Step Predictor	Standardized βeta	R^2 Change	*t*	*p*	part correlation²
Model 1					
Client gender	.14		2.62**	.009	.02
Lifetime trauma	.24		4.61***	.000	.05
B24 depression	.39		6.54***	.000	.10
B24 psychosis	.11		1.98*	.049	.01
B24 AOD	- .00		- .07	.946	.00
		.36			
R^2	.36				
Adjusted R^2	.35				
F (*df* = 5 / 263)	29.35***				
Model 2					
Client gender			2.33*	.021	.01
Lifetime trauma			2.36*	.019	.01
B24 depression			4.94***	.000	.05
B24 psychosis			.20	.841	.00
B24 AOD			- .58	.561	.00
Cognitions total *(Self, World, Self-Blame)*			7.16***	.000	.11
		.11			
R^2	.46				
Adjusted R^2	.45				
F Change	51.32***				
F (*df* = 5/262)	37.71***				

*p < .05 **p <.01 ***p <.001

Reference:

Hypothesis 4

Trauma-related negative appraisals overall (total of *self, world, self-blame*) will have a positive and significant association with traumatic stress symptoms after controlling for gender, lifetime trauma, symptom severity of both depression and psychosis, and alcohol/other drug use.

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APPENDIX A

Survey Instrument

MHRH-RI CMHC ASSESSMENT/EVALUATION INSTRUMENT

(This questionnaire is to be completed at each client's six-month review)

[Part I: To be completed by referencing record; omissions can be completed with client, if needed]

Client's gender 1. male 2. female

Client's age _____

Marital Status 1. Never Married 2. Married 3. Separated/Divorced 4.Widowed 5. Unknown

Years of education completed _____ (for example, use "12" for high school graduate)

Primary Racial Identity: 1. Amer. Indian/Alaska Native 2. Asian 3. African/American
4. Hawaiian/Pacific Islander 5. White 6. Hispanic 7. Multi-racial 8. NA

Hours worked for pay in the past month: ____

Estimated gross annual household income (to nearest thousand) ___ ___ ___ , 000.00

Primary Income Source: 1. Self 2. Relative 3. Welfare 4. SSI/SSDI 5. other

Insurance (Circle all that apply) 1. Medicaid/ Ritecare 2) Medicare 3) Medicare/Medicaid 4) Third party 5) none

Psychiatric History:
Age of onset (first time diagnosed) ____

Client ever hospitalized for MH/SA problem?	1. Yes	2. No
Client hospitalized (MH/SA) within the past year?	1. Yes	2. No
Is client taking *anti-psychotic medication*?	1. Yes	2. No
Is client taking *anti-depressant medication*?	1. Yes	2. No
Is client taking *anti-anxiety medication*?	1. Yes	2. No

Does client have an Axis I diagnosis of schizophrenia? 1. Yes 2. No
Does client have an Axis I diagnosis of major mood disorder? 1. Yes 2. No
Does client have an Axis I diagnosis of a substance use disorder? 1.Yes 2. No

How often does client need to be prompted to take their psychiatric medication according to prescription?

1. Almost never 2. 25% of the time 3. 50% of the time 4. 75% of the time 5. Almost always

How long has client been served in this agency since original admission? Years ___ Months ____
How long has client been assigned to the current program? Years ___ Months ____

Client's most recent program assignment? 1. RIACT I 2. RIACT 2 3. CSP 4. MHPRR

Axis I diagnoses (primary) ___ ___ ___.___ ___ (secondary) ___ ___ ___.___ ___

Axis II diagnosis ___ ___ ___.___ ___ *Axis V* (GAF score) _____

End of Part 1

Part II: To be completed in a face-to-face interview with client

BASIS-24

(Main control variables include subscales measuring depression, psychosis, and alcohol / other drugs)

DEPRESSION: items 1, 2, 3, 9, 10, 12 (noted as 'DEP' for designated items)

PSYCHOSIS: items 14, 15, 16, 17 (noted as 'PSY' for designated items)

ALCOHOL / OTHER DRUGS: items 21, 22, 23, 24 (noted as 'AOD' for designated items)

During the PAST WEEK, how much difficulty did you have…

1. Managing your day-to-day life? (DEP)

No difficulty	A little difficulty	Moderate difficulty	Quite a bit of difficulty	Extreme difficulty
1	2	3	4	5

2. Coping with problems in your life? (DEP)

No difficulty	A little difficulty	Moderate difficulty	Quite a bit of difficulty	Extreme difficulty
1	2	3	4	5

3. Concentrating? (DEP)

No difficulty	A little difficulty	Moderate difficulty	Quite a bit of difficulty	Extreme difficulty
1	2	3	4	5

During the PAST WEEK, how much of the time did you…

4. Get along with people in your family?

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

5. Get along with people outside your family?

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

6. Get along well in social situations?

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

7. Feel close to another person?

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

8. Feel like you had someone to turn to if you needed help?

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

9. Feel confident in yourself? (DEP)

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

During the PAST WEEK, how much of the time did you…

10. Feel sad or depressed? (DEP)

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

11. Think about ending your life?

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

12. Feel nervous? (DEP)

None of the time	A Little of the time	Half of the time	Most of the time	All of the time
1	2	3	4	5

During this PAST WEEK, how often did you…

	Never	Rarely	Sometimes	Often	Always
13. Have thoughts racing through your head?	1	2	3	4	5
14. Think you had special powers? (PSY)	1	2	3	4	5
15. Hear voices or see things? (PSY)	1	2	3	4	5
16. Think people were watching you? (PSY)	1	2	3	4	5
17. Think people were against you? (PSY)	1	2	3	4	5
18. Have mood swings?	1	2	3	4	5
19. Feel short-tempered?	1	2	3	4	5

20. Think about hurting yourself?	Never	Rarely	Sometimes	Often	Always
	1	2	3	4	5
21. Did you have an urge to drink alcohol or take street drugs? (AOD)	Never	Rarely	Sometimes	Often	Always
	1	2	3	4	5
22. Did anyone talk to you about your drinking or drug use? (AOD)	Never	Rarely	Sometimes	Often	Always
	1	2	3	4	5
23. Did you try to hide your drinking or drug use? (AOD)	Never	Rarely	Sometimes	Often	Always
	1	2	3	4	5
24. Did you have problems from your drinking or drug use? (AOD)	Never	Rarely	Sometimes	Often	Always
	1	2	3	4	5

STRESSFUL EVENTS

Below is a list of stressful/traumatic events. Based on careful interviewing with the client, indicate the number of times the client has ever experienced that event in his / her life.

*Items recoded using midpoints as estimates so that 1=0, 2=1, 3=3.5, 4=8, 5=11

1. Was physically abused (other than sexual assault):

Lifetime? (1) None (2) One time (3) 2-5 times (4) 6-10 times (5) More than 10 times

2. Was sexually abused

Lifetime? (1) None (2) One time (3) 2-5 times (4) 6-10 times (5) More than 10 times

3. Saw another person seriously harmed or killed in combat, home or crime situation

Lifetime? (1) None (2) One time (3) 2-5 times (4) 6-10 times (5) More than 10 times

4. Experienced the unexpected death of a close friend, family member, or loved one

Lifetime? (1) None (2) One time (3) 2-5 times (4) 6-10 times (5) More than 10 times

5. Was homeless for more than one day

Lifetime? (1) None (2) One time (3) 2-5 times (4) 6-10 times (5) More than 10 times

6. Suffered a life-threatening injury or illness that caused you to fear for your life.

Lifetime? (1) None (2) One time (3) 2-5 times (4) 6-10 times (5) More than 10 times

IDENTIFICATION OF INDEX TRAUMA IN REFERENCE TO PSS-I & PTCI ITEMS

What was the most stressful or traumatic event you ever experienced in your life? (Circle only one)

1. physical abuse 2 sexual abuse 3. saw someone harmed or killed

4. unexpected death of loved one 5. was homeless 6. life-threatening injury or illness

7. other (write in) _____

Practitioner, please continue……

PTSD SCALE (brief version) -DEPENDENT VARIABLE-

Say to your client: "Think about the most stressful or traumatic event that you just identified. "How often during the **past 7 days** have you experienced the following particular symptoms **in reaction to that "most stressful or traumatic event?"** Use the scale below to rate the client's answers.

Not at all	**Once per week/ a little**	**2 or 4 times per week/ somewhat**	**5 or more times per week/ very much**
0	**1**	**2**	**3**

1. Have you been feeling very emotionally upset when you were reminded of the trauma (for example, feeling scared, angry, sad, guilty)? ___

(*Re-experiencing*; item #4 from full scale)

2. Have you been feeling distant or cut off from people around you since the trauma? ___

(*Avoidance*; item #10 from full scale)

3. Have you been having trouble concentrating (for example, drifting in and out of conversations, losing track of a story on television, forgetting what you read)? ___

(*Arousal;* item #15 from full scale)

<u>POSTTRAUMATIC COGNITIONS [PTCI items]</u> –MAIN INDEPENDENT VARIABLE-

Say to your client: People react to stressful or traumatic events in many different ways. I'd like to know what you think NOW about your worst stressful or traumatic experience. How strongly do you <u>agree or disagree</u> with the following statements?

strongly disagree	disagree	not sure	agree	strongly agree
1	2	3	4	5

My life has been destroyed by the trauma. ***(SELF)*** ___

I have no future. ***(SELF)*** ___

I have been permanently changed for the worse. ***(SELF)*** ___

I have to be especially careful because you never know what can happen next. ***(WORLD)*** ___

People are not what they seem. ***(WORLD)*** ___

You can never know who will harm you. ***(WORLD)*** ___

The event happened because of the way I acted. ***(SELF BLAME)*** ___

There is something about me that made the event happen. ***(SELF BLAME)*** ___

The event happened to me because of the sort of person I am. ***(SELF BLAME)*** ___

Interviewer: Take a few moments to "de-brief" the client, explore how they feel now having answered these questions, and see if they have any concerns that need to be addressed. Let them know you are available to them if any upsetting feelings or distress arise.

Thank the client for their participation in the interview.

APPENDIX B

Qualitative / write-in responses to 'most stressful event' from RI 2009 pilot (*48 comments*)

Deaths, losses other than "sudden," and threat of loss (total of 19)

"Death of mom"

"Death of mother, but was not unexpected"

"Death of grandson"

"Parents dying"

"Death of parents"

"Family death"

"Death of grandmother (client was 12 years old)"

"Watching my father's suicide"

"When mother got sick"

"Father being imprisoned"

"Incarceration of husband"

"Being taken away from mom and not getting to see her that often"

"Lost children to DCYF" (RI child welfare department)

"My son being accused unjustly of sexual abuse which led to him going to the training school"

"Placed daughter in home since my mental health issues interfere with being able to care for her"

"Signing over rights to kids…2 adopted, 1 biological"

"Father was involved in an accident that almost killed him"

"Lived in an orphanage when parents divorced"

"When client left his dog behind"

Emotional abuse (total of 7)

"Teasing at school"

"Abuse in all areas from family"

"Psychological abuse by ex-husband."

"Marriage to ex-husband…physical/psychological abuse"

"Father abused physically and mentally"

"Emotional abuse from peers/father"

"Emotional abuse"

Being diagnosed/hospitalized with a mental illness, psychiatric crisis (total of 9)

"Falling down due to seizures"

"When diagnosed with schizophrenia"

"Diagnosis"

"When I was diagnosed with schizo-affective"

(at age 26) "Had a panic attack and thought it was a heart attack"

"Mental illness"

"Involuntary hospitalization and loss of pets"

"Suicide attempt"

"Suicide attempt by o.d."

Other (13)

"Dysfunctional childhood"

"My daughter being molested."

"Son being sick and misbehaving"

"An acquaintance cut wrists in presence of client at high school"

"Fight in high school"

"Mistakes I made in sports"

"Being pregnant after rape"

"Move to the USA"

"Blacking-out one night after drinking"

"Crack use"

"Broke both arms in MVA" (motor vehicle accident)

"Stealing a car and getting in an accident"

"Intimacy problems with husband"