THE ROLE OF AVOIDANT COPING IN THE TREATMENT OF RAPE-RELATED POSTTRAUMATIC STRESS DISORDER

by

AMY SELVIG LEINER

(Under the Direction of Joan Lynne Jackson)

ABSTRACT

Although there are a number of empirically supported therapies for posttraumatic stress disorder (PTSD), a large minority of those treated fail to respond. Many researchers have attempted to identify variables (participant variables, trauma variables, and treatment variables) that impact PTSD treatment outcome. A review of this literature suggested that there are few, if any, variables that consistently impact PTSD treatment outcome and that few studies are driven by theoretical models of PTSD or its recovery. The cognitive theory of PTSD suggests that a decrease in the avoidance of trauma-related information is required for successful treatment. The current investigation studies the role of a related construct, avoidant coping, in the treatment of rape-related PTSD. Women with PTSD following rape (N = 62) received nine sessions of an empirically supported PTSD treatment (prolonged exposure or eye movement desensitization and reprocessing). PTSD severity was assessed before, during, and after treatment. Avoidant coping was measured before and after treatment. Results indicated that avoidant coping decreased during the course of treatment and that changes in PTSD symptoms were correlated with changes in avoidant coping. Contrary to hypothesis, pretreatment avoidant coping was negatively associated with posttreatment PTSD severity when pretreatment severity was taken

into account. Likewise, high levels of pretreatment avoidant coping were associated with a more rapid decline of PTSD symptoms during treatment. Finally, pretreatment avoidant coping did not predict dropout or posttreatment diagnostic status. This study suggests that PE and EMDR are particularly effective at reducing symptom severity for women with initially high levels of avoidant coping.

INDEX WORDS: Posttraumatic stress disorder (PTSD); Treatment Outcome; Rape; Avoidant coping; Prolonged exposure; Eye movement desensitization and reprocessing (EMDR).

THE ROLE OF AVOIDANT COPING IN THE TREATMENT OF RAPE-RELATED POSTTRAUMATIC STRESS DISORDER

by

AMY SELVIG LEINER

B.A., Agnes Scott College, 1997

M.S., University of Georgia, 2004

A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2006

THE ROLE OF AVOIDANT COPING IN THE TREATMENT OF RAPE-RELATED POSTTRAUMATIC STRESS DISORDER

by

AMY SELVIG LEINER

Major Professor: Joan L. Jackson

Committee: Steven R. H. Beach
J. Mark Davis

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
August 2006

ACKNOWLEDGEMENTS

I would like to extend my gratitude and appreciation to several important people who have supported me through this process. First, I would like to thank Barbara Rothbaum and her team of researchers and therapists at Emory University who collected the data and allowed me to analyze it. Conducting a treatment-outcome study is a huge undertaking, and I appreciate all of their hard work. Second, I would like to express my gratitude to my committee members whose contributions helped me to develop and refine this project. I would like to thank my husband Hal for his constant encouragement and support. Renee Scheinder has also been a good resource and cheerleader for me during this process. Finally, my deepest thanks go to my academic advisor, Joan Jackson, for her steadfast confidence in me throughout my graduate career.

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

REVIEW OF LITERATURE

Overview

Posttraumatic stress disorder (PTSD) is a distressing, prolonged reaction to trauma. PTSD has a prevalence of 8% in the general population, and raped women may make up the largest proportion of PTSD sufferers. Although there are a number of empirically supported therapies for PTSD, a large minority of those treated fail to respond. The following review will describe studies that have attempted to identify variables that impact PTSD treatment outcome, both generally and specifically for rape-related PTSD. The review will then consider the cognitive theory of PTSD and the three prerequisites it proposes for PTSD recovery. One of these prerequisites, avoidance of trauma-related information, has yet to be considered as a variable that may impact PTSD treatment outcome. The review concludes with a proposal to investigate the role of avoidant coping in the treatment of rape-related PTSD.

Posttraumatic Stress Disorder and Its Treatment

Posttraumatic Stress Disorder (PTSD) is characterized by the development of distinctive anxiety features following exposure to a traumatic event. These features are reexperiencing symptoms (e.g., distressing dreams or intrusive recollections of the trauma), avoidance and numbing symptoms (e.g., avoidance of trauma-related activities or places, diminished interest in activities), and hyperarousal symptoms (e.g., hypervigilance, difficulty falling or staying asleep; American Psychiatric Association, 1994). The prevalence of PTSD in the general population is

8%, with women being more than twice as likely as men to have a lifetime diagnosis of PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

The *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) notes that the traumatic event must have two essential features. First, the person must experience, witness, or confront actual or threatened death or serious injury. Second, the event must evoke intense fear, helplessness, or horror. Events meeting these criteria are very common in the United States. The National Comorbidity Survey (NCS; Kessler et al., 1995) reported that 60% of men and 51% of women experienced at least one traumatic event during their lifetime. Furthermore, Kessler and colleagues (1995) found that rape was the trauma most likely to lead to PTSD. They found that 46% of women and 65% of men who reported rape as their most upsetting trauma subsequently developed PTSD. Moreover, the largest proportion of PTSD sufferers (21%) was comprised of raped women (Kessler et al., 1995).

These statistics demonstrate the importance of developing effective treatment for women with PTSD following rape. Fortunately, researchers have identified a number of effective treatments for PTSD. To date, the Federal Drug Administration has approved two medications for the treatment of PTSD: sertraline (Brady et al., 2000; Davidson, Rothbaum, van der Kolk, Sikes, & Farfel, 2001) and paroxetine (Marshall, Beebe, Oldham, & Zaninelli, 2001; Tucker et al., 2001). Fluoxetine has also demonstrated efficacy over placebo (Connor, Sutherland, Tupler, Malik, & Davidson, 1999; Martenyi, Brown, Zhang, Koke, & Prakash, 2002; van der Kolk et al., 1994).

Several psychotherapies have demonstrated efficacy over waitlist or minimal treatment control conditions in well controlled studies. The American Psychological Association's Task

Force on the Promotion and Dissemination of Psychological Procedures (Chambless et al., 1998) identified exposure therapy (e.g., Foa, Rothbaum, Riggs, & Murdock, 1991; Keane, Fairbank, Caddell, & Zimering, 1989), stress inoculation training (Foa et al., 1999; Foa et al., 1991), and eye movement desensitization and reprocessing (EMDR; Rothbaum, 1997; Wilson, Becker, & Tinker, 1995) as "probably efficacious" treatments for PTSD. These conclusions were echoed by the International Society for Traumatic Stress Studies, which described EMDR as "efficacious" for the treatment of PTSD (Chemtob et al., 2000), but found the strongest evidence for cognitive behavioral techniques (CBT; Foa, Keane, & Friedman, 2000). Of the CBT techniques studied, prolonged exposure (PE) had the most evidence for its efficacy from the most well controlled studies (Rothbaum et al., 2000).

Despite the abundance of effective PTSD treatments, considerable progress has yet to be made, especially among psychotherapies. For example, authors have noted that a significant minority of patients do not respond to the most effective treatments (Cahill, Foa, & Taylor, 2004; Hembree et al., 2001). A recent meta-analysis considered PTSD psychotherapy studies published over 23 years and revealed that 44% of those who started psychotherapy and 33% of those who completed a course of psychotherapy continued to meet criteria for PTSD (Bradley, Greene, Russ, Dutra, & Westen, 2005). Rates were only slightly better in four studies of rape victims being treated with well validated treatments (Foa et al., 1991; Resick, Nishith, Weaver, Astin, & Feuer, 2002; Rothbaum, 1997; Rothbaum, Astin, & Marsteller, 2005). In these studies 41% of rape victims who started psychotherapy and 23% of rape victims who completed psychotherapy continued to meet criteria for PTSD at the end of treatment.

Factors Related to Treatment Response

Several investigators have attempted to understand what factors impact treatment response. Treatment response refers to the success of treatment and has been defined in many ways by various researchers. Some researchers utilize gain scores, which represent the decreases in symptom severity scores between pretreatment and posttreatment. Other researchers consider the failure to meet PTSD criteria after treatment or simply low scores on symptom scales. Regardless of the operational definition, most research in this area has focused on finding pretreatment or early-treatment variables that predict treatment response. Authors have investigated three types of variables: participant variables, index trauma variables, and treatment variables.

Participant Variables

Demographics. Several studies have investigated the relationship between demographic variables and treatment outcome. Age has consistently been unrelated to outcome (Basoglu, Livanou, Salcioglu, & Kalender, 2003; Ehlers et al., 1998; Ehlers, Clark, Hackmann, McManus, & Fennell, 2005; Foa et al., 1991; Jaycox, Foa, & Morral, 1998; Krakow et al., 2001; Munley, Bains, Frazee, & Schwartz, 1994; Perconte & Griger, 1991; Tarrier, Sommerfield, Pilgrim, & Faragher, 2000; van Minnen, Arntz, & Keijsers, 2002). Gender, however, has yielded mixed results. Tarrier et al. (2000) found that women have better treatment outcome, but in other studies no gender effects were found (Basoglu et al., 2003; Ehlers et al., 2005; Jaycox et al., 1998; Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998; van Minnen et al., 2002; Wilson et al., 1995). In a review of gender and treatment outcome, Carson, Grubaugh, and Resick (2002) concluded that women responded as well or better than men during PTSD treatment. Race has shown no relationship with treatment outcome (Ehlers et al., 1998; Foa et al., 1991). The

majority of studies investigating the relationship between marital/relationship status and outcome have found no relationship (Basoglu et al., 2003; Ehlers et al., 1998; Ehlers et al., 2005; Foa et al., 1991; Munley et al., 1994; Tarrier et al., 2000; van Minnen et al., 2002). However, Wilson and colleagues (1995) found that married individuals gained more from therapy than single and divorced individuals. Generally employment status has failed to predict treatment outcome (Ehlers et al., 1998; Foa et al., 1991; Tarrier et al., 2000), but one study found that unemployed participants were more likely to drop out of treatment (Foa et al., 1999). Likewise, educational attainment (Basoglu et al., 2003; Ehlers et al., 1998; Munley et al., 1994; Tarrier et al., 2000; van Minnen et al., 2002; Wilson et al., 1995) and socioeconomic status (SES; Foa et al., 1991; Munley et al., 1994; Wilson et al., 1995) are typically unrelated to posttreatment status, but contrary to expectations, Ehlers and colleagues (2005) found that less education and lower SES were correlated with better outcome. Finally, Munley (1994) found that IQ was not related to treatment outcome.

Symptoms. Researchers have also investigated various pretreatment symptoms to determine if they have a relationship with outcome. For example, investigators have studied the relationship between pretreatment PTSD severity and posttreatment outcome. Not surprisingly, studies have reported that high pretreatment PTSD severity is related to high posttreatment PTSD severity (Blanchard et al., 2003; van Minnen et al., 2002) and to dropout (Chard, 2005; Marks et al., 1998). Taylor and colleagues (2001) found that high levels of pretreatment numbing symptoms were associated with partial rather than full response. In another study, Taylor (2003) found that low pretreatment levels of re-experiencing symptoms were related to posttreatment remission of PTSD. On the other hand, Foa, Riggs, Massie, and Yarczower (1995) found that severe pretreatment PTSD was associated with more benefit from treatment. Other studies have

found no relationship between pretreatment PTSD severity and posttreatment PTSD severity (Basoglu et al., 2003) or gain scores (Wilson et al., 1995).

The high correlation between PTSD and major depression (Kessler et al., 1995) has prompted research investigating the relationship between mood symptoms and treatment outcome. Several studies found no relationships between pretreatment depression severity and treatment outcome (Basoglu et al., 2003; Ehlers et al., 1998; Jaycox et al., 1998; Taylor, 2003). However, some research groups have found that greater depression was related to suboptimal outcome at posttreatment (Taylor et al., 2001) and at nine-month follow-up (Forbes, Creamer, Hawthorne, Allen, & McHugh, 2003). Other researchers found that low suicide risk predicted better outcome (Tarrier et al., 2000). Moreover, one research group found that the improvement in negative mood regulation during the early phase of their treatment, which focused on skills training in affect and interpersonal regulation, predicted reduction of PTSD symptoms during the latter treatment phase, which focused on exposure therapy (Cloitre, Koenen, Cohen, & Han, 2002). One study investigated mania symptoms and found that high hypomania scores were associated with worse clinician-rated improvement (Munley et al., 1994).

Researchers have also investigated the relationship between PTSD and other anxiety constructs. Findings concerning pretreatment anxiety and outcome are mixed. Neither a comorbid anxiety disorder diagnosis (Ehlers et al., 2005) nor a specific diagnosis of generalized anxiety disorder (GAD; Tarrier et al., 2000; van Minnen et al., 2002) have been associated with immediate outcome. However, researchers have found that a comorbid GAD diagnosis was related to more severe PTSD symptoms at six-month follow-up (Tarrier et al., 2000). Taylor (2003) investigated the construct of anxiety sensitivity and found no association with treatment outcome.

Ford and Kidd (1998) investigated the impact of Disorders of Extreme Stress, Not Otherwise Specified (DESNOS) on treatment outcome. DESNOS (van der Kolk, Pelcovitz, Roth, & Mandel, 1996), also called "complex PTSD" (Herman, 1992), are proposed to be problems in self-regulation, consciousness, and relationships due to repeated interpersonal trauma during childhood (Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997). Ford and Kidd (1998) found that in a sample of inpatient veterans with PTSD, a diagnosis of DESNOS predicted poor outcome after controlling for trauma exposure, quality of life, depression, personality disorders, and childhood trauma history.

Substance Use. Substance-use disorders are highly comorbid with PTSD (Creamer, Burgess, & McFarlane, 2001; Kessler et al., 1995) and substance use may be conceptualized as an avoidance behavior (Stewart, Pihl, Conrod, & Dongier, 1998) which may prolong recovery. Therefore it has received attention regarding its impact on the treatment of PTSD. Pretreatment weekly alcohol consumption has been associated with worse outcome in one study (Perconte & Griger, 1991). In another study pretreatment alcohol use predicted PTSD symptoms nine months after treatment (Forbes et al., 2003). However another study found no relationships between alcohol use and PTSD at posttreatment or follow-up (van Minnen et al., 2002). Results regarding benzodiazepines suggest an interaction with their use and time since treatment. Three research groups found no relationship between their use and posttreatment outcome (Krakow et al., 2001; Taylor, 2003; van Minnen et al., 2002), but one of these groups did find a significant relationship with their use and poorer outcome at one-month follow-up (van Minnen et al., 2002). Researchers have found no relationship between outcome and the use of antidepressants (Basoglu et al., 2003; Krakow et al., 2001; Taylor, 2003).

Pretreatment Functioning. Investigators have also considered the impact of pretreatment functioning on outcome. Taylor found in one study lower levels of functioning were associated with good response (Taylor et al., 2001), but he found no similar relationship in a later study (Taylor, 2003). Blanchard and colleagues (2003) used number of days missed from work as a proxy variable for functional impairment. They found that missed days predicted posttreatment PTSD severity in motor vehicle accident survivors. van Minnen and colleagues (2002) found no relationship between pretreatment functioning and outcome or dropout.

Emotions. PTSD is often associated with negative emotions (e.g., anger, guilt; McFarlane, 1988; Riggs, Dancu, Gershuny, & Greenberg, 1992) and dysfunctional beliefs (Dunmore, Clark, & Ehlers, 1999). Therefore the impact of these constructs on treatment outcome has been considered by several researchers. Some studies have demonstrated that the magnitude of pretreatment anger is related to treatment outcome both immediately (Foa et al., 1995) and at follow-up (Forbes et al., 2003). However, two other studies found no such relationship (Taylor, 2003; van Minnen et al., 2002). In two studies no relationship was found between outcome and guilt (Taylor, 2003; van Minnen et al., 2002). One study investigated trauma-related shame and found no relationship between it and outcome (van Minnen et al., 2002). Regarding posttrauma beliefs, Livanou and colleagues (2002) found that pretreatment beliefs regarding mistrust, helplessness, and unjustness of the world did not predict improvement. Similarly, Taylor (2003) found that negative beliefs about self and the world were not related to outcome.

Personality Constructs. Personality constructs have been related to development and maintenance of PTSD (Hyer et al., 1994; Knezevic, Opacic, Savic, & Priebe, 2005). In predicting treatment outcome, Tarrier and colleagues (2000) found that extroversion,

neuroticism, and psychoticism were not related to treatment outcome. Likewise, van Minnen and colleagues (2002) found that personality-disorder constructs measured by the Personality Disorders Questionnaire-Revised (Hyler & Rieder, 1987) and the SCID-II (Spitzer, Williams, Gibbon, & First, 1987) did not predict treatment outcome. Researchers have found that individuals with borderline personality disorder (BPD) had similar posttreatment reductions in PTSD symptoms as those without BPD, however, those with BPD were less likely to achieve good end state functioning (Feeny, Zoellner, & Foa, 2002). Similar results were found for individuals with PTSD and any personality disorder (Hembree, Cahill, & Foa, 2004).

Emotional engagement. Some researchers have speculated that a participant's ability to successfully engage themselves with the trauma memory during treatment is an integral component of successful exposure treatment (Foa & Rothbaum, 1998). However, various indicators of emotional engagement have yielded mixed results. First, Foa's research group found that intense facial fear during the first exposure session was associated with more benefit from treatment (Foa et al., 1995), and participants who experienced high levels of subjective distress during early exposure sessions followed by gradual habituation benefited more from treatment than other participants (Jaycox et al., 1998). However, Tarrier and colleagues (2002) found that pretreatment electrodetermal activity during various emotionally valenced vignettes (e.g., neutral, general trauma, participant specific trauma) was not related to treatment outcome.

Social Environment. Three research groups have investigated the relationship between participants' social environment and treatment response. First, Tarrier, Sommerfield, and Pilgrim (1999) compared the treatment response of clients with high expressed emotion (EE) relatives and low EE relatives. They found that clients with high EE relatives had less improvement over the course of therapy. Perconte and Griger (1991) found a trend between positive family support

and good posttreatment status in Vietnam veterans receiving PTSD treatment. However, Gillespie, Duffy, Hackmann, and Clark (2002) found that the presence or absence of a supportive relationship did not predict treatment response.

Cumulative Trauma History. Although many aspects of the index trauma have been considered (see below), participants' history regarding other traumas has also been investigated. Recent research has indicated a positive relationship between the number of lifetime traumatic experiences and severity of PTSD symptoms following the index trauma (Arata, 1999; Banyard, Williams, & Siegel, 2001; Follette, Polusny, Bechtle, & Naugle, 1996). However the relationship between cumulative trauma history and treatment outcome has been inconsistent. Several studies have failed to find a relationship between cumulative trauma history and treatment outcome (Basoglu et al., 2003; Ehlers et al., 1998; Ehlers et al., 2005; Jaycox et al., 1998; Tarrier et al., 2000; van Minnen et al., 2002). In a sample of sexually assaulted women, Krakow (2001) failed to find that repeated exposure to sexual abuse was related to treatment outcome. In a sample of women with sexual and nonsexual assault, Hembree, Street, and colleagues (2004) found that experience of other traumas in adulthood did not predict outcome, but a history of potentially traumatizing events in childhood did. van Minnen and colleagues (2002) found no relationship between childhood trauma history and treatment outcome.

Index-Trauma Variables

Trauma Type. The NCS found differences in the rate of PTSD associated with various trauma types (Kessler et al., 1995), and this has lead researchers to speculate that individuals with different types of trauma will respond differently to treatment. However, this hypothesis has not been consistently supported. In mixed-trauma samples, there were no differences in outcome between various trauma types (Ehlers et al., 2005; Tarrier et al., 2000; Wilson et al., 1995). Two

studies demonstrated that the response to treatment was similar between survivors of childhood sexual abuse and survivors of other index traumas (Ehlers et al., 1998; Jaycox et al., 1998). Likewise, two research groups found no difference between traumas inflicted by a perpetrator (e.g., rape, assault, and robbery) and accidents (Marks et al., 1998; van Minnen et al., 2002). Within the assault literature, researchers failed to find a relationship between outcome and the identity of the assailant (stranger versus known acquaintance; Foa et al., 1991) or the type of assault (rape versus non-sexual assault; Hembree, Street et al., 2004). Similarly, disaster researchers found that among individuals who survived an earthquake, their experience and/or role in the disaster (e.g., being trapped under rubble; loss of family members, friends, or property; participating in rescue work) did not predict treatment outcome (Basoglu et al., 2003).

Severity of Trauma. Research has repeatedly supported a relationship between trauma severity and the likelihood of developing PTSD (Brewin, Andrews, & Valentine, 2000; Girelli, Resick, Marhoefer-Dvorak, & Hutter, 1986; Kilpatrick, Saunders, Amick-McMullan, & Best, 1989). Therefore researchers have investigated indicators of trauma severity as potential predictors of treatment outcome. A significant relationship between outcome and retrospective ratings of threat or danger during the trauma has not been found (Basoglu et al., 2003; Ehlers et al., 1998; Foa et al., 1991; Hembree, Street et al., 2004; Tarrier et al., 2000). Similarly, combat exposure ratings in veterans have not been associated with outcome (Perconte & Griger, 1991). Some investigators have conceptualized use of a weapon during assault as an indication of severity, but this has not been associated with outcome (Foa et al., 1991; Hembree, Street et al., 2004). Sustaining physical injury during the trauma has predicted worse outcome in two studies (Gillespie et al., 2002; Hembree, Street et al., 2004), but this relationship was not found in a third (Foa et al., 1991). However, pain associated with injuries sustained during the trauma has been

associated with poor treatment response (Taylor et al., 2001). In one study, duration of the assault in minutes was negatively correlated with change in symptom severity during treatment (Ehlers et al., 1998), but a relationship was not found between these variables in another study (Foa et al., 1991).

Time Elapsed between Trauma and Treatment. Research suggests that, although some individuals have chronic PTSD, symptoms decrease naturally over time for the majority of people (Kessler et al., 1995; Rothbaum, Foa, Riggs, & Murdock, 1992). Therefore, the timing of treatment relative to the index trauma may influence response. Contrary to hypothesis, Gillespie and colleagues (2002) found a non-significant trend for individuals with more time elapsed between trauma and treatment to improve more than those treated with a shorter lapse. Other researchers have found no relationship between elapsed time since trauma and treatment response (Basoglu et al., 2003; Ehlers et al., 2005; Resick et al., 2002).

Treatment Variables

Treatment Type. As stated earlier, CBT (e.g., stress inoculation training and exposure therapy) and EMDR have demonstrated efficacy in multiple well controlled treatment-outcome studies. In an effort to find the best possible treatment for clients, authors have compared various efficacious treatments to one another. However, there have been few indications that one treatment is superior to another. For example, SIT and exposure therapy have been equally effective, and combining the two techniques has not shown added benefit over either one alone (Feeny et al., 2002; Foa et al., 1999; Foa et al., 1991). In two studies, exposure therapy and cognitive therapy were equally effective (Marks et al., 1998; Tarrier, Pilgrim et al., 1999). In one study the combination of exposure therapy and cognitive restructuring predicted better outcome on some measures compared to exposure alone (Bryant, Moulds, Guthrie, Dang, & Nixon,

2003). In other research, augmenting exposure therapy with cognitive components has demonstrated no added benefit (Foa et al., 2005; Foa & Rauch, 2004; Marks et al., 1998; Paunovic & Öst, 2001; Resick et al., 2002). In most studies EMDR has been as effective as exposure therapy (Ironson, Freud, Strauss, & Williams, 2002; Rothbaum et al., 2005; Vaughan, Armstrong, Gold, & O'Connor, 1994). However, Taylor (2003) found that exposure therapy was superior to EMDR, and Devilly and Spence (1999) found that the combination of exposure and cognitive therapy was superior to EMDR. Nonetheless, authors of a recent meta-analysis concluded that research does not support differential efficacy of psychotherapies for PTSD (Bradley et al., 2005). Generally, the specific empirically validated treatment a patient receives does not predict his or her response.

Non-Specific Treatment Variables. Many authors have speculated that nonspecific treatment variables may affect the success of therapy (e.g., van Minnen et al., 2002). Cloitre and colleagues (2002) found that therapeutic alliance during early, non-exposure sessions predicted reductions of PTSD symptoms across later exposure-therapy sessions. Other researchers have investigated the utility of treatment expectations in predicting treatment response, and most failed to find a significant relationship (Devilly, Spence, & Rapee, 1998; Ehlers et al., 1998; Tarrier et al., 2000; van Minnen et al., 2002). Devilly and Spence (1999) found that expectancy correlated with improvement in global distress during exposure treatment, but not during EMDR treatment. Some groups have found that motivation (Foa et al., 1991; van Minnen et al., 2002) and credibility (Devilly & Spence, 1999) were not correlated with treatment outcome. However, Tarrier, Pilgrim, and colleagues (1999) found that participants who experienced a worsening of PTSD over the course of treatment perceived their treatment as less credible and were less motivated than participants whose symptoms did not worsen. Compliance with treatment

procedures generally leads to better results. For example, attending group therapy sessions (Tarrier, Pilgrim et al., 1999; Tarrier et al., 2000) or participating in treatment activities during a partial hospitalization program (Perconte & Griger, 1991) have been positively correlated with treatment response. However, homework compliance has yielded mixed results. In one study better homework compliance was associated with more posttreatment clinical-rated improvement (Marks et al., 1998), but in another study it was not related to reductions in posttreatment symptoms (Foa et al., 1991). Gender of the therapist and gender match between therapist and client have not been associated with outcome (Wilson et al., 1995).

Summary of Attempts to Find Factors Related to Poor Outcome

It is clear from this literature review that there are few, if any, consistent predictors of response to PTSD treatment. Among person-level variables, age and race have been consistently unrelated to treatment outcome, but other demographic variables yielded mixed results. The relationships between treatment response and pretreatment symptoms of PTSD, depression, and other anxiety constructs are unclear. Likewise, pretreatment functioning, substance use, negative trauma-related emotions, dysfunctional beliefs, cumulative trauma history and personality constructs do not consistently predict treatment outcome. Among index-trauma variables, the type of trauma, its severity, and the elapsed time between it and the treatment are not consistently related to treatment response. Among treatment variables, the type of treatment does not adequately predict response. Other treatment variables (i.e., gender of therapist, treatment expectations, client motivation, perceived credibility of treatment, and homework compliance) are not consistently associated with outcome. There are, however, some variables that may potentially impact treatment response, but these require further research: emotional engagement

during early exposure sessions, client's family/social environment, duration of assault, therapeutic alliance, and level of participation in group or partial hospitalization programs.

There may be several reasons for the paucity of variables that strongly or consistently relate to PTSD treatment outcome. First, consistent definitions and measures have not been used. Authors define good or poor outcome differently and use different measures of similar predictor variables. Second, Taylor (2003) suggested that predictors may only be moderately related to outcome and are therefore unlikely to reach significance consistently. Similarly, studies often use a relatively small sample size compared to the number of predictors thereby making replication difficult (van Minnen et al., 2002). Also, van Minnen suggested that potential predictors may be specific to a particular treatment and therefore inconsistent results may be due to the use of different treatment strategies across studies (van Minnen et al., 2002). Similarly, predictor variables may differ between traumas, with some variables being particularly important to treatment outcome following some types of traumas but not others. Therefore, in the following section I have specifically considered factors related to treatment outcome in rape-related PTSD.

Factors Related to Outcome in Rape-Related PTSD

First, Foa and colleagues (1991) randomly assigned 55 rape victims with PTSD to one of four groups: SIT, PE, supportive counseling, or wait-list control. To search for potential outcome predictors, numerous variables were correlated with measures of psychological functioning at posttreatment and follow-up in the entire sample. Potential predictors included demographic variables (age, race, marital status, income, and occupation) and assault characteristics (time since assault, injury, relationship to assailant, duration of assault, use of weapon, and perception of life threat). None of the correlations were significant. The authors did not comment about the absence of significant predictors, but at least one explanation may account for the null findings.

Specifically, the authors did not control for assignment to wait-list. Inclusion of data pertaining to wait-list participants may have washed out any significant correlation between potential predictors and treatment response. A more informative approach would have been to investigate the relationship between potential predictors and symptom levels in the subsample of participants assigned to active-treatment.

Second, Krakow and colleagues (2001) randomly assigned 168 women with PTSD resulting from sexual assault to imagery rehearsal therapy (IRT) or wait-list control. Imagery rehearsal therapy is a three-session treatment that provides psychoeducation about trauma-related nightmares and encourages patients to emotionally process nightmares with imagery techniques while awake. The IRT group experienced significant decreases in the frequency of nightmares and severity of PTSD symptoms while the waitlist group did not. The authors found that improvement was not moderated by concurrent psychotherapy, age, antidepressant use, anxiolytic/hypnotic use, degree of high-magnitude sexual assault (not defined by the authors) or a history of repeated exposure to sexual abuse. The authors suggested that the failure to find moderators of outcome may have been due to low power in three-factor ANOVAs (group by time by moderator variable).

Finally, Ehlers et al. (1998) hypothesized that cognitive variables would mediate the response to treatment in women who had been sexually assaulted. Specifically, they investigated the effect of two variables: 1) mental planning versus mental defeat and 2) overall feeling of alienation/permanent change. The authors conceptualized mental planning versus mental defeat as a thought process that occurs during the trauma. A participant who reported using intentional actions to minimize harm or to influence the response of the assailant during the assault would rate high on this construct. On the other hand, reporting perceptions of giving up or being

defeated during the assault would rate low. The concept of alienation/permanent change refers to descriptions of postrape interpersonal interactions that elicit the sense of being blamed, being mistreated, not being believed, being unable to relate, or feeling that others did not meet her needs. In a two-by-two design, participants were grouped by their response to treatment (good outcome or inferior outcome) and treatment type (PE alone or a combination of PE and SIT). Group members were matched on their initial PTSD severity scores. Good and inferior-outcome groups differed only on the duration of the assault in minutes; the inferior-outcome group's mean assault duration was over three times longer that of the good outcome group. Blind raters coded two trauma narratives from every participant on mental planning versus mental defeat and on overall feeling of alienation/permanent change.

Results indicated that the good-outcome group reported significantly more mental planning than did the inferior-outcome group. The groups did not differ on the feeling of alienation/permanent change. Both measures correlated negatively with percent improvement in PTSD symptoms. The relationship between mental planning/defeat and symptom improvement remained significant when assault duration was covaried out. There were no differences between treatments. The authors tested the correlation between change in PTSD severity and several other variables but none were significant. These included demographic variables (age, ethnic group, marital status, employment, education), assault characteristics (time since assault, attempted versus completed rape, expectation to be killed, presence of weapon, stranger assailant versus known assailant), trauma history (child sexual abuse, previous rape/attempted rape, subsequent rape), clinical variables (depression, detachment from others), and treatment expectancy variables (treatment is logical, confidence in self, confidence in others).

In all, research on rape-related PTSD has investigated 28 factors potentially related to treatment outcome. However, only one variable (mental planning) was related to outcome. In this respect, the research on rape-related PTSD is similar to that in the broader PTSD treatment-outcome field. Many variables have failed to have a consistent relationship with outcome (e.g., demographic variables, identity of assailant, and perception of life threat), and other variables yielded mixed results or require further research (injury sustained during the assault, duration of the assault, trauma history, and mental planning). As discussed earlier, mixed results may be due to a number of methodological factors. Another weakness in this body of literature is that few studies focus on correlates that are theoretically associated with recovery from PTSD.

The Theory of Trauma Recovery

In the twentieth century a variety of theories were developed to explain PTSD. These included biological (Kolb, 1987; Krystal, Southwick, Charney, & Schacter, 1995), psychodynamic (Horowitz, 1976; Kardiner, 1941), behavioral (Keane, Zimering, & Caddell, 1985) and psychobiological (Jones & Barlow, 1990) theories of trauma response. However, cognitive theories have provided the most developed explanation for PTSD symptoms (Brewin, Dalgleish, & Joseph, 1996; Harvey, 1999), have contributed to the development of the most validated treatment for PTSD: CBT (Foa et al., 2000), and therefore, will be discussed in this proposal.

Cognitive theories have explained PTSD as an information-processing dysfunction (Chemtob, Roitblat, Hamada, & Carlson, 1988; Creamer, Burgess, & Pattison, 1992; Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989; Litz & Keane, 1989). According to cognitive theorists, a fear network of the trauma is established in the memory (Foa et al., 1989; Litz & Keane, 1989). This network contains information about the trauma stimuli, responses to these

stimuli, and their meaning (Foa et al., 1989). Activation of the fear network results in intrusive memories, attentional bias toward threat, and physiological arousal (Chemtob et al., 1988; Creamer et al., 1992; Foa & Kozak, 1986). This pattern is maintained by attempts to avoid memories or stimuli (Creamer et al., 1992; Foa, Huppert, & Cahill, 2006). Recovery occurs through activation of the network (emotional processing of the memory) so that more adaptive responses and meanings are integrated into the network (Foa et al., 2006). Thus, cognitive theories predict three prerequisites for recovery (Harvey, 1999): emotional engagement with the trauma memory, change in maladaptive trauma-related beliefs, and reduction of trauma-related avoidance.

Research focusing on the first two prerequisites has yielded promising results in the field of treatment outcome. For example, indicators of in-session fear activation, such as facial fear (Foa et al., 1995), high subjective distress (Jaycox et al., 1998), and heart rate activation (Pitman, Orr, Altman, & Longpre, 1996) early in treatment were associated with good treatment outcome. Regarding change in maladaptive beliefs, Taylor (2003) found that negative beliefs about self and the world were not related to outcome. Similarly, Livanou and colleagues (2002) found that pretreatment beliefs regarding mistrust, helplessness, and unjustness of the world did not predict improvement. However, researchers have found that improvements in such maladaptive beliefs were correlated with decreases in PTSD symptoms (Foa & Rauch, 2004; Livanou et al., 2002). The impact of the third prerequisite, reduction of trauma-related avoidance, has received little attention in the treatment-outcome literature, and therefore is the focus of this study.

Avoidant Coping and Recovery from Rape

Avoidance of trauma information is a means to deal with traumatic distress; and in this sense it is a coping response. Coping refers to behavioral and cognitive strategies used by people

to deal with stressful events and negative emotional states (Lazarus & Folkman, 1984). Although potential coping responses may be varied and complex, all may be conceptualized as approach or avoidance methods (Roth & Cohen, 1986). Approach coping is any strategy oriented toward threat, while avoidance coping is any strategy oriented away from threat. According to Cohen and Roth (1987), there are theoretical costs and benefits of either coping type when dealing with the stress of rape. Avoidance strategies can reduce immediate stress through avoidance of rape-related threat, but avoidance behaviors may disrupt daily life and lead to emotional numbness. On the other hand, approach strategies may lead to increased immediate distress but may allow adjustment to the rape in the long term. There is partial support for this theory. Empirical research suggests that rape victims use both strategies to some extent, but only avoidant coping strategies are associated with variability in recovery. Specifically, use of avoidant coping is related to more severe PTSD symptoms following rape (Boeschen, Koss, Figueredo, & Coan, 2001; Cohen & Roth, 1987; Santello & Leitenberg, 1993) and longer time to recover from sexual assault (Valentiner, Foa, Riggs, & Gershuny, 1996).

There are two means by which avoidant coping could impact treatment outcome. First, women with an avoidant coping style may use subtle avoidant strategies, such as distraction, during in-session exercises that promote engagement with the trauma memory. Several studies with individuals with specific phobias suggest that mild to moderate distraction (e.g., studying word lists; having a conversation) during in vivo exposure interferes with habituation (Grayson, Foa, & Steketee, 1986; Rodriguez & Craske, 1993; Telch et al., 2004), and two studies suggest that distraction actually facilitates habituation and symptom reduction (Johnstone & Page, 2004; Oliver & Page, 2003). However, no research has investigated the effect of distraction during the imaginal exposure techniques most often used during PTSD treatment. A second method through

which an avoidant coping style may attenuate the effect of treatment is through out-of-session avoidance. It is possible that women with a more avoidant coping style participate fully in in-session exercises, but continue to be avoidant outside therapy sessions. For example, they may continue to escape from a trauma-related cue when it is found in the environment and/or they may avoid doing prescribed engagement exercises (i.e., homework). On the other hand, women who employ less avoidant coping are less likely to avoid trauma-related stimuli outside therapy, and may use out-of-session opportunities to activate their fear network. Therefore, an avoidant coping style may negatively impact treatment.

CHAPTER 2

RATIONALE AND HYPOTHESES

Rape is prevalent and frequently leads to PTSD (Kessler et al., 1995). However, a large minority of people do not respond to PTSD treatment (Bradley et al., 2005) and research on factors that impact the success of PTSD treatment is scarce (Hembree, Street et al., 2004). Avoidance is theoretically linked to an attenuated treatment response (Harvey, 1999), but this hypothetical relationship has not been researched. Therefore, the purpose of the proposed study is to investigate the role of avoidant coping during validated treatment for the treatment of rape-related PTSD. Specifically, the proposed research questions are: 1) How does avoidant coping change during the course of PTSD treatment? 2) What is the relationship between change in PTSD symptoms and change in avoidant coping during treatment? 3) What is the predictive value of avoidant coping levels for PTSD treatment outcome?

According to Harvey (1999) decreases in avoidance are associated with successful treatment. Therefore, I predict that participants will report lower levels of avoidant coping at posttreatment compared to pretreatment (hypothesis 1). Also, I predict a positive relationship between change in PTSD symptoms severity and change in avoidant coping from pre- to posttreatment (hypothesis 2).

If reduction in avoidant coping is a prerequisite for recovery from PTSD (Harvey, 1999), then it is plausible that individuals with high pretreatment levels of avoidant coping would have less than optimal treatment outcome. Therefore, I predict a positive relationship between pretreatment avoidant coping and posttreatment PTSD symptom severity while accounting for

pretreatment symptom severity (hypothesis 3). Similarly, I predict a negative relationship between pretreatment avoidant coping level and the rate of symptom decline during treatment (hypothesis 4). I also predict a positive relationship between pretreatment avoidant coping and meeting diagnostic criteria for PTSD at posttreatment (hypothesis 5). Finally, I predict a positive relationship between pretreatment avoidant coping and dropout (hypothesis 6).

CHAPTER 3

METHOD

Participants

Participant and treatment-outcome observations were obtained from an existing database that was compiled during a study comparing PE, EMDR, and waitlist conditions in the treatment of PTSD. Portions of this data have been published (Rothbaum et al., 2005), presented at national conferences (Astin & Rothbaum, 2001; Rothbaum, 2001; Rothbaum & Astin, 2001; Selvig, Rothbaum, Jackson, & Astin, 2004a, 2004b, 2004c), and submitted for publication (Leiner, Jackson, Astin, & Rothbaum, 2006).

Participants were adult female victims of completed rape who met criteria for PTSD as a primary diagnosis. To control for the natural decline of PTSD symptoms following rape (Rothbaum et al., 1992) the assault must have occurred at least three months prior to study participation. To control for the effects of pharmacological treatment, participants were not taking any psychotropic medication and agreed not to initiate any psychotropic treatment during their study participation. Other exclusion criteria included current alcohol or substance abuse or dependence, ongoing involvement in a physically or sexually abusive relationship, current involvement in legal proceedings associated with the assault, and current suicidal intent. Written and verbal informed consent was obtained after procedures were fully explained to the potential participant and before the pretreatment assessment. The Institutional Review Board of Emory University approved the consent form and study protocol.

Originally, 82 women were recruited through study advertisements and referrals. Of the original sample, nine women were referred to non-study clinicians because they did not meet diagnostic criteria for PTSD (n = 6), met criteria for current alcohol abuse (n = 1), were currently involved in a physically abusive relationship (n =1), or were not able to meet with the therapist during regular office hours (n = 1). One participant decided to end study participation after assessment procedures. Of the 74 women enrolled in the original study, one dropped out during the assessment phase, and one was terminated and referred during treatment for not meeting treatment criteria. Of the remaining 72 women, 23 were randomly assigned to PE, 25 to EMDR, and 24 to waitlist control condition. Of the 20 women who completed waitlist procedures, 18 continued to meet criteria for a diagnosis of PTSD and were subsequently randomized to PE or EMDR. At this point, four women declined the treatment offered and withdrew from the study. Of the remaining waitlist participants, eight initiated PE and six initiated EMDR. Thus the final number of women initiating PE treatment was 31 and EMDR treatment was 31. Six women dropped out of PE treatment, and five women dropped out of EMDR treatment.

Measures

Structured interviews

A trained assessor diagnosed Axis I disorders (except PTSD) using the Structured Clinical Interview for DSM-IV, Non-Patient Version (SCID; First, Spitzer, M, & Williams, 1996). The SCID is a standardized diagnostic interview that asks about every DSM-IV symptom of most Axis I disorders. In the current dataset, the interrater reliability for diagnostic agreement in the SCID was 98.30% with a kappa of .79.

Diagnosis and severity of PTSD were assessed with the Clinician Administered PTSD Scale (CAPS; Blake et al., 1997), an interview that assesses all 17 symptoms of PTSD for

frequency and intensity. In addition to a total PTSD severity score, the CAPS yields three symptom cluster scales: reexperiencing, avoidance, and hyperarousal. A review of its psychometric properties (Keane et al., 2000) reports that the CAPS has strong test-retest reliability (between .90 and .98), internal consistency (.94 within symptom clusters), and construct validity (correlating between .77 and .91 with other PTSD severity scales) across a variety of trauma and PTSD samples. In the current dataset, the interrater reliability of the CAPS for diagnosis of PTSD was 92.52% with a kappa of .83.

Self-report measures

Severity of PTSD over the past week was assessed with the Posttraumatic Symptom Scale-Self Report (PSS-SR; Foa, Riggs, Dancu, & Rothbaum, 1993). This questionnaire has 17 items corresponding to each PTSD symptom. Like the CAPS the PSS-SR has a total score and subscales for reexperiencing, avoidance, and hyperarousal. The PSS-SR has demonstrated excellent reliability as evidenced by good internal consistency for the total score (alpha = .92) and the symptom subscales (.78 for reexperiencing, .80 for avoidance, .82 for hyperarousal) and by good test-retest reliability (kappa = .74 for total symptoms, .66 for reexperiencing, .56 for avoidance, .71 for hyperarousal). The total score correlates highly with the Impact of Event Scale (r = .78), another scale assessing PTSD severity (Foa et al., 1993).

Avoidant coping was measured with the Disengagement Subscale of the Coping Strategies Inventory (Tobin, Holroyd, Reynolds, & Wigal, 1989). The CSI was derived by means of hierarchical factor-analysis using items intended to reflect empirically-supported coping methods (e.g., wishful thinking). The 36-item Disengagement Subscale taps into coping strategies that are associated with avoidance of stressor-related thoughts, failure to initiate behaviors that might change the stressful situation, and “wishful thoughts and fantasies [that]

draw attention away from the stressor" (Tobin et al., 1989, p. 350). The items from this scale are rated on a 5-point scale according to the extent to which the strategy is used to manage a particular life stressor (1 = not at all to 5 = very much). Each item describes an example of avoidant coping (e.g., "I went along as if nothing were happening." "I avoided thinking of doing anything about the situation."). Respondents use a 5-point scale (1 = *not at all* to 5 = *very much*) to endorse the extent to which they use the strategy to manage a particular life stressor. The participants of the current study were asked to make ratings in regard to the index rape. The disengagement subscale has good internal consistency (alpha = .89) and test-retest reliability (kappa = .79; Tobin et al., 1989).

Two additional measures of emotional functioning will be analyzed for descriptive purposes. First, the Beck Depression Inventory—Revised Edition (BDI-II; Beck & Steer, 1987) is a 21-item self-report measure that assesses depressive symptoms during the past week. The BDI-II correlates highly with clinicians' ratings of depression (r = .96), and it has demonstrated high internal consistency in an outpatient sample (mean coefficient alpha = .86; Beck & Steer, 1987).

Second, the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) is a 40-item questionnaire that assesses general anxiety. The first 20 items assess state anxiety (STAI-State), or how the respondent feels now. The second 20 items assess trait anxiety (STAI-Trait), or how the respondent generally feels. Test-retest reliability of the trait anxiety scale is .81 and that of the state scale is .40. Internal consistency of the two scales ranges from .83 to .92. It shows good construct validity as evidenced by high correlations with the Taylor Manifest Anxiety Scale (r = .80; Taylor, 1953) and the Anxiety Scale of the Institute of Personality and Ability Testing (r = .75; Cattell & Scheier, 1963).

Procedure

Assessment

Trained independent assessors, who were blind to treatment conditions, conducted all of the structured-interview assessments that were analyzed in the study. All self-report questionnaires and structured interviews were completed at pretreatment and posttreatment assessment sessions. At each of the nine therapy sessions, the participants completed the PSS-SR. At the midpoint in therapy (session 5), participants completed the BDI-II and the STAI in addition to the PSS-SR.

Treatment

The EMDR and PE conditions were delivered in nine, individual, ninety-minute, twice-weekly sessions. Therapists used the manual distributed at EMDR training workshops. The first two sessions of the EMDR protocol were devoted to information gathering, explanations of treatment rationale, and treatment planning. The next seven sessions involved desensitization and reprocessing, during which the client is instructed to imagine a scene that represents the worst part of the trauma, focus on the sensations of distress in her body, and rehearse negative thoughts that match the picture. Once the distress about this imagined scene drops significantly, the client is asked to track the therapist's finger while rehearsing a new, preferred belief. The therapist and client repeated this sequence until the new statement feels true to the client.

The PE treatment used in this study was the same as that used in previous efficacy studies of PE authored by Foa and colleagues (Foa et al., 1999; Foa et al., 1991). The first two sessions were devoted to information gathering, explanations of treatment rationale, treatment planning, and developing a hierarchy of avoided situations for *in vivo* exposure homework. The next seven sessions involved reliving the rape scene through imagination. Clients were instructed to try to

imagine the rape scene as vividly as possible and to describe it aloud in the present tense. Therapists encouraged the clients to narrate the rape in entirety by repeating it several times for 45 to 60 minutes per session in order to facilitate habituation. The therapist tape-recorded the narratives and instructed each client to listen to the most recent narrative at home at least once daily.

Therapist Adherence and Skill

Three female, doctoral level psychologists provided PE or EMDR therapy. Therapist A provided EMDR to 15 participants and PE to 15 participants. Therapist B provided EMDR to five participants and PE to four participants. Therapist C provided EMDR to 11 participants and PE to 12 participants. Study caseloads were determined by therapist availability. A chi square of Therapist by Treatment was not significant (X^2 (2) = .155, p > .25).

To insure treatment adherence and competence (Waltz, Addis, Koerner, & Jacobson, 1993) two session tapes from half of participants receiving either EMDR or PE were independently rated for treatment integrity by treatment experts. Dr. Francine Shapiro rated EMDR sessions, and Dr. Edna Foa designated a PE expert from her research group to rate PE sessions. Experts rated EMDR sessions as 92.09% adherent and PE sessions as 90.46% adherent for components considered essential to each protocol. Raters evaluated therapist skill for essential and unique therapy components on a 7-point scale (1 = “poor”, 4 = “adequate”, and 7 = “excellent”). The mean rating for the EMDR therapists’ skill was “very good” (M = 6.04, SD = 0.58), and the PE therapists’ skill was “very good” (M = 5.80, SD = 0.66).

CHAPTER 4

ANALYSIS STRATEGY

Demographic and Descriptive Variables

Several demographic variables were reported for the study sample: age, race, education status, marital status, parental status, employment status, and household income status, time since rape, and dropout. Likewise, descriptive statistics were reported for pretreatment, and posttreatment for the following variables: CSI Disengagement Coping Subscale, PSS-SR Symptom Scale scores (total, reexperiencing, avoidance, and hyperarousal), CAPS severity scores (total, reexperiencing, avoidance, hyperarousal), BDI-II, and STAI (State and Trait forms). Previous analyses revealed no significant treatment-group differences on demographic variables, the PSS-SR Symptom Scale, the CAPS, the BDI-II, nor the STAI (Selvig, 2004). To determine if PE and EMDR groups had different levels of avoidant coping or if the treatments had differential effects on avoidant coping during treatment, I conducted a 2-way repeated measures ANOVA on the CSI Disengagement Coping Scale with time (pretreatment and posttreatment) as the within-participants factor and treatment group as the between-participants factor. Had there been a group effect with significance level of less than .05 ($p < .05$), or an interaction effect with significance level of less than .15 ($p < .15$), then analyses would have been done separately for each treatment group.

Hypothesis 1

To examine whether treatment resulted in significant decreases in avoidant coping from pre- to posttreatment, I conducted a dependent samples *t*-test with time (pre- and posttreatment)

as the independent variable and the CSI Disengagement Subscale as the dependent variable. According to Harvey (1999), decreases in avoidance are associated with successful treatment; therefore, I predicted a medium to large effect size for this test. Using GPOWER (Faul & Erdfelder, 1992), I calculated that a medium effect size (f = .25) would yield a power of .56 and a large effect size (f = .40) would yield a power of .97 when the sample size is 53, degrees of freedom is 52, and alpha is set at .05. In addition, I calculated the proportion of individuals who experienced clinically significant and reliable change in avoidant coping during the treatment interval.

Hypothesis 2

To test the relationship between changes in PTSD severity and changes in avoidant coping from pre- to posttreatment, I calculated residual change scores for each of the following: all PSS-SR Scale Scores (total, reexperiencing, avoidance, and hyperarousal) and the CSI Disengagement Subscale. Steketee and Chambless (1992) recommended using residual gain scores because they adequately measure change without the problems inherent in raw change scores (i.e., monomethod variance and over- or underestimation of change). Then I conducted Pearson correlations between the residual changes scores of the CSI Disengagement Subscale and each of the PSS-SR scores. Again, I estimated a medium to large effect size given Harvey's (1999) prediction that recovery is associated with decreases in avoidance. Using GPOWER (Faul & Erdfelder, 1992), I calculated that a medium effect size (f = .3) would yield a power of .73 and a large effect size (f = .5) would yield a power of .99 when the sample size is 53 and alpha is set at .05.

Hypothesis 3

To determine if a relationship exists between pretreatment avoidant coping and posttreatment PTSD symptom severity while accounting for pretreatment symptom severity I used multiple linear regression. The criterion variable was the posttreatment PSS-SR Total Symptom Score. On the first step of the regression equations I entered pretreatment PTSD severity as measured by the PSS-SR Total Symptom Score. On the second step I entered the pretreatment avoidant coping level as measured by the CSI Disengagement Subscale. I repeated this procedure for each of the PSS-SR Symptom Cluster subscales with the respective posttreatment score as the criterion and the respective pretreatment score entered in the first step.

Again, I estimated a medium to large effect size given Harvey's (1999) prediction that recovery is associated with decreases in avoidance. Using GPOWER (Faul & Erdfelder, 1992), I calculated that a medium effect size (f^2 = .15) would yield a power of .68 and a large effect size (f^2 = .35) would yield a power of .97 when the sample size is 53 and alpha is set at .05.

Hypothesis 4

To examine the relationship between pretreatment avoidant coping level and rate of symptom decrease over treatment, I used hierarchical linear modeling. The slope of symptom change was modeled using the scores of the PSS-SR scales in the level 1 model. In the level 2 model, pretreatment CSI Disengagement Subscale was entered as a predictor variable for the level 1 slope.

Hypothesis 5

To determine if there was relationship between pretreatment avoidant coping and the absence of PTSD diagnosis at posttreatment, I used logistic regression. Pretreatment avoidant coping as measured by the CSI Disengagement Subscale was the predictor variable.

Posttreatment diagnosis was the criterion variable and coded as "0" for *no PTSD diagnosis* and "1" for *PTSD diagnosis*.

Hypothesis 6

To determine if there was a relationship between pretreatment avoidant coping and dropout, I used logistic regression. Pretreatment avoidant coping as measured by the CSI Disengagement Subscale was entered as the predictor variable. Dropout was the criterion variable and coded as "0" for *no Dropout* and "1" for *Dropout*.

CHAPTER 5

RESULTS

Demographic and Descriptive Variables

Sixty-two women with rape-related PTSD initiated study treatment. Of these, nine women (14.5%) dropped out of the study before completing treatment. Of the 53 women who completed treatment, 45 (84.9%) no longer met criteria for PTSD at the end of treatment. Therefore, I estimated that 27.4% (n = 17) of the women who started psychotherapy and 15.1% (n = 8) of the women who completed psychotherapy continued to meet criteria for PTSD at the end of their treatment. These rates were significantly more favorable than those reported in the literature by Bradley and colleagues (2005) for PTSD psychotherapies (χ^2 (1) = 6.92, $p < .01$, w = .34, and χ^2 (1) = 7.69, $p < .01$, w = .53, respectively).

Demographics are reported in Table 1. Descriptive statistics for pre- and posttreatment psychological measures are reported in Table 2. The sample's mean pretreatment score on the CDI-Disengagement Coping Subscale (M = 100.4, SD = 29.6) was similar to the mean reported by Littleton and Breitkopf (2006) of college women with a history of rape (M = 107.3, SD = 24.1). On the other hand, the posttreatment mean score was 1.75 standard deviations lower than that reported for the university sample of raped women.

To determine if PE and EMDR groups had different levels of avoidant coping or had differential change in avoidant coping during treatment, I did a 2-way repeated-measures ANOVA on the CSI Disengagement Coping Subscale with time (pretreatment and posttreatment) as the within-participants factor and treatment group as the between-participants

factor. There was not an interaction effect ($F(1, 49) = .02$, $p = .89$; partial $\eta^2 < .001$) nor a group effect ($F(1) = 0.96$, $p > 05$, $\eta^2 = .02$). Therefore, treatment groups were collapsed for subsequent analyses.

Hypothesis 1

The hypothesis that participants' avoidant coping would decrease over treatment was supported by a dependent samples *t*-test comparing the pre- and posttreatment CSI-Disengagement Subscale scores. As expected, mean posttreatment scores ($M = 65.4$, $SD = 22.0$) were significantly lower than mean pretreatment scores ($M = 100.2$, $SD = 28.9$), $t(50) = 9.18$, $p < .001$, $d = 1.37$. I found that 51% of participants who completed treatment met criteria for clinically significant and reliable change (Jacobson & Truax, 1991) on the CSI Disengagement Subscale.

Hypothesis 2

Results of Pearson correlations supported the hypothesis that pre- to posttreatment changes in PTSD symptom severity would be positively correlated with pre- to posttreatment change in avoidant coping. Residual gain scores of the CSI Disengagement Subscale were positively correlated with residual gain scores of the PSS-SR total score ($r\ (50) = .63$, $p < .001$), the reexperiencing subscale ($r\ (50) = .58$, $p < .001$), the avoidance and numbing subscale ($r\ (50) = .57$, $p < .001$), and the hyperarousal subscale ($r\ (50) = .51$, $p < .001$). When comparing the magnitude of these correlations, I found no statistical differences (Reexperiencing versus Avoidance and Numbing: $t\ (48) = 0.93$, $p > .05$; Reexperiencing versus Hyperarousal $t\ (48) = 0.65$, $p > .05$; Avoidance and Numbing versus Hyperarousal $t\ (48) = 0.65$, $p > .05$).

Hypothesis 3

To test avoidant coping's utility in predicting posttreatment PTSD symptom severity, four separate regression analyses were performed, one for each posttreatment PSS-SR scales (total symptoms, reexperiencing subscale, avoidance and numbing subscale, and hyperarousal subscale). On the first step of each analysis I entered the respective pretreatment PSS-SR score, and on the second step I entered the pretreatment avoidant coping level as measured by the CSI Disengagement Subscale. To verify that pretreatment avoidant coping did not interact with treatment group, I entered this interaction on the third step.

The expected positive relationship between pretreatment avoidant coping and posttreatment PTSD symptoms was not found. Avoidant coping was found to be a significant predictor of posttreatment total PTSD symptoms when accounting for pretreatment total PTSD symptoms (F (1, 49) = 4.83, p = .03, ΔR^2 = .08). However, the relationship between pretreatment avoidant coping and posttreatment PTSD symptoms was *negativ*e (β = -0.31; t (51) = -2.20, p = .03,), meaning that higher scores on the CSI Disengagement Subscale before treatment were associated with less severe total PTSD symptoms after treatment and vice versa. A similar pattern of results was found for the avoidance and numbing symptom cluster (F (1, 49) = 8.93, p = .004, ΔR^2 = .13; t (51) = -2.99, p = .004, β = -0.41). Avoidant coping was not associated with posttreatment reexperiencing symptoms or hyperarousal symptoms when accounting for the respective pretreatment symptoms. The interaction between avoidant coping and treatment group was not significant in any PSS-SR scale. Tolerance for all coefficients ranged from .77 to .98. Table 3 reports the results of these multiple linear regression analyses, and Table 4 reports bivariate correlations between the CSI Disengagement Subscale scores and PSS-SR scores for participants who completed treatment.

Given that avoidant coping and avoidance and numbing symptom are similar concepts, I did an exploratory analysis to see if avoidant coping was a significant predictor of posttreatment total symptoms when pretreatment avoidance and numbing symptoms were accounted for. This analysis was significant (F (1, 49) = 5.95, p = .02, ΔR^2 = .10), indicating that pretreatment avoidant coping accounted for significant variance in posttreatment total symptoms beyond that of pretreatment avoidance and coping symptoms.

Hypothesis 4

To examine the relationship between pretreatment avoidant coping and rate of symptom decline over treatment, I used hierarchical linear modeling. All analyses were computed using HLM Version 6.02a (Raudenbush, Bryk, & Congdon, 2005). The following model was tested to determine if the pretreatment CSI-Disengagement Subscale score was a significant predictor of the rate of change over treatment (π_{1i}) for each scale of the PSS-SR scores.

$$\textit{Level 1:} \quad PSS\text{-}SR_{ij} = \pi_{0i} + \pi_{1i}SESSION_{ij} + \varepsilon_{ij}$$

$$\textit{Level 2} \quad \pi_{0i} = \gamma_{00} + \gamma_{01}(DISENGAGEMENT_i) + \xi_{0i}$$

$$\pi_{1i} = \gamma_{10} + \gamma_{11}(DISENGAGEMENT_i) + \xi_{1i}$$

Contrary to hypothesis, the analysis of PSS-SR total symptoms yielded a significant negative coefficient (γ_{11} = -0.02, SE = .01; t(59) = -3.74, p < .001) for the linear term of the Level 2 function which models the rate of symptom change over treatment. This result indicates that high levels of pretreatment avoidant coping are associated with more rapid rates of symptom change. Additionally, the analysis revealed a positive coefficient for the linear term of the Level 2 function which models symptom levels at pretreatment (γ_{01} = 0.15, SE = .05; t(59) = 3.34, p = .002). This result indicated that avoidant coping and PTSD symptoms were positively correlated at pretreatment. Analyses of the three symptom clusters revealed a similar pattern of results.

Results of all HLM analyses are presented in Table 5. Figure 1 is a conceptual model demonstrating how the CSI-Disengagement Subscale is related to rate of symptom change during treatment. The illustration was developed using predicted values from the HLM analysis of PSS-SR total symptoms.

Hypothesis 5

To determine if there was a relationship between pretreatment avoidant coping and the absence of PTSD diagnosis at posttreatment, I used logistic regression. I found that, among those who completed treatment, pretreatment scores on the CSI Disengagement Subscale did not significantly predict PTSD diagnostic status (*Odds ratio* = 0.99, $p > .05$; see Table 6).

Hypothesis 6

I also used logistic regression to determine if there was a relationship between pretreatment avoidant coping and dropout. I found that pretreatment scores on the CSI Disengagement Subscale did not significantly predict dropout (*Odds ratio* = 1.00, $p > .05$; see Table 6).

CHAPTER 6

DISCUSSION

Hypotheses 1

As hypothesized, PTSD treatment resulted in significant decreases in avoidant coping. The degree of change was significant and reduced the overall sample mean to 1.75 standard deviations below that of a comparable nontreated sample. Approximately half of the women who competed the study experienced clinically significant and reliable decreases in avoidant coping.

According to Harvey (1999) the cognitive theory of PTSD suggests that decreases in avoidance would be associated with successful treatment. Therefore, it is not surprising that during PE and EMDR, two empirically supported treatments, one would observe decreases in avoidant coping. However, the mechanism of this change is not known. One possibility is that treatment directly reduces avoidant coping strategies by discouraging them through client education. Another possibility is that treatment increases other coping strategies (e.g., engagement strategies), thereby reducing a PTSD sufferer's reliance on avoidant coping strategies. Yet another possibility is that avoidant coping is affected by treatment indirectly. For example, treatment directly reduces symptom severity, and therefore, at the end of treatment a client needs fewer coping strategies to manage PTSD symptoms.

Hypothesis 2

The hypothesis that pre- to posttreatment changes in avoidant coping would be associated with pre- to posttreatment changes in symptom levels was also supported. The results clearly demonstrate that reductions in avoidant coping are strongly related to reductions in all types of

PTSD symptoms. This is in line with the cognitive theory of PTSD, which posits that decreases in avoidance indirectly results in decreases in symptoms. The theory suggests that decreases in avoidance results in activation of the fear network. This, in turn, promotes adoption of adaptive responses and beliefs, which then result in less severe trauma symptoms (Foa et al., 2006). The current findings support the general premise that decreases in avoidance lead to decreases in symptoms. More research is needed to determine if the proposed intermediary relationships are valid.

Hypothesis 3

Contrary to hypothesis, pretreatment avoidant coping was negatively related to posttreatment total symptoms when accounting for pretreatment symptom levels. This suggested that individuals with initially high levels of avoidant coping have less severe symptoms at posttreatment, and vice versa. Results of symptom-cluster analyses suggested that this finding may be primarily due to the relationship between avoidant coping and avoidance and numbing symptoms. However, the exploratory post hoc analysis confirmed that pretreatment avoidant coping and pretreatment avoidance and numbing symptoms each independently explained variance in posttreatment total symptoms. Interestingly, I found that pretreatment avoidance and numbing symptoms were positively correlated with posttreatment total symptom severity while pretreatment avoidant coping was negatively correlated with posttreatment total symptom severity. This result implied that although these two constructs are conceptually related, their roles differ as predictors of posttreatment symptom severity.

Hypothesis 4

Unexpectedly, the HLM analysis revealed that pretreatment avoidant coping was negatively associated with the rate of symptom change during treatment. This signifies that high

levels of avoidant coping at the onset of treatment are associated with more rapid symptom decline and vice versa. Additionally, I found that pretreatment avoidant coping is positively correlated with pretreatment total symptoms.

The model developed from the HLM predicted scores (Figure 1) helped to explain the results of the regression analysis. At pretreatment, avoidant coping and total symptoms are positively correlated. Those participants with high levels of pretreatment avoidant coping had the most severe symptoms at pretreatment, but also experienced the fastest and greatest reductions in symptom severity. Their symptom reductions were so great that by the end of treatment they have fewer PTSD symptoms then those with initially low levels of avoidant coping. Those individuals with low levels of avoidant coping at the onset of treatment had relatively less severe symptoms at the onset of treatment, but they experienced relatively little symptom alleviation from treatment. In all, the results of the HLM analyses implied that treatment is most beneficial for individuals who frequently engage in avoidant coping at the onset of treatment.

Hypothesis 5

The hypothesis that pretreatment avoidant coping would predict PTSD diagnostic statu sat posttreatment was not supported. This null result may be due to a small sample size and the small proportion of women who continued to meet criteria for PTSD at the end of treatment.

Hypothesis 6

The hypothesis that pretreatment avoidant coping would be associated with dropout was not supported. Again, this null result may be due to a small sample size and a small proportion of dropouts.

Limitations

This study had several methodological limitations. First, most of the measures used in analyses were self-report questionnaires. Collaborating self-report questionnaires with clinician-administered measures would add validity to my findings. Second, I used correlational analyses, which prevent true causal attributions. As with many variables in clinical psychology, avoidant coping cannot be randomly assigned. However, the causal relationship between avoidant coping and PTSD symptoms would be better explicated with multiple observations (three or more) over treatment. By assessing how these variables related temporally, one would be able to make a relatively stronger statement regarding any causal relationship between them. Finally, the results of this study are generalizable only to raped women with PTSD who are treated with PE or EMDR. It is not yet known if similar results would be found in samples with other traumas, in samples of men, or in samples with other treatments.

Implications and Directions for Future Research

The current study represents the first known investigation of the role of avoidant coping in the treatment of rape-related PTSD. There were three primary findings. First, PE and EMDR appear to have an impact on avoidant coping such that it lessens with treatment. Second, changes in avoidant coping are positively related to changes in PTSD symptoms during treatment. Third, avoidant coping appears to have utility as a predictor of treatment outcome. I found that high levels of pretreatment avoidant coping are related to a faster decrease of symptoms during treatment and lower symptom levels at the end of treatment.

Previously, I suggested that higher levels of pretreatment avoidant coping may interfere with symptom improvement through avoidance of emotional processing opportunities during treatment. However, the results suggests otherwise. PE and EMDR appear to be especially

effective for individuals who at the onset of treatment are engaging in many avoidant coping strategies. How can this be? It appears that, for some individuals, avoidant coping strategies help to maintain PTSD symptoms as the cognitive theory of PTSD suggests. PE and EMDR results in the decreases of at least one form of avoidant coping—the avoidance of trauma memories. The cognitive theory of PTSD suggests that decreased avoidance results in decreased symptoms. Thus, participants who are able to greatly decrease their avoidant coping during treatment experience the greatest decline in symptom severity.

The findings, however, imply an unfortunate corollary. Those individuals with initially low levels avoidant coping experience relatively small symptom reductions during treatment. It is possible that their initially low levels of avoidant coping leave little room for decline. Without the ability to greatly reduce avoidant coping, their symptoms are not able to improve. Another possibility is that their PTSD symptoms are maintained by another mechanism—a mechanism other than avoidant coping.

This study highlights at least three areas for further research. First, more research regarding the role of avoidant coping in treatment is warranted. Specifically, it is important that these results are replicated in another sample. My literature review demonstrated that few variables are related to treatment outcome consistently across studies. Also, study designs using more time points would help to elucidate possible relationships suggested by cognitive theory (e.g., avoidant coping and activation of the fear network). Second, the current findings suggest that avoidant coping and avoidance and numbing symptoms are overlapping yet different constructs. Further research is needed to understand their relationship and their distinct roles in predicting treatment response. Finally, research is needed to improve treatment outcome for individuals with initially low levels of avoidant coping.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4 ed.). Washington, DC: Author.

Arata, C. M. (1999). Repeated sexual victimization and mental disorders in women. *Journal of Child Sexual Abuse, 7*(3), 1-17.

Astin, M. C., & Rothbaum, B. O. (2001, November). *Perceived quality of life in rape survivors before and after CBT treatment.* Paper presented at the annual meeting of the International Society of Traumatic Stress Studies, New Orleans, LA.

Banyard, V. L., Williams, L. M., & Siegel, J. A. (2001). The long-term mental health consequences of child sexual abuse: An exploratory study of the impact of multiple traumas in a sample of women. *Journal of Traumatic Stress, 14*(4), 697-715.

Basoglu, M., Livanou, M., Salcioglu, E., & Kalender, D. (2003). A brief behavioural treatment of chronic post-traumatic stress disorder in earthquake survivors: Results from an open clinical trial. *Psychological Medicine, 33*(4), 647-654.

Beck, A. T., & Steer, R. A. (1987). *Manual for the revised Beck Depression Inventory*. San Antonio, TX: Psychological Corporation.

Blake, D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Charney, D. S., & Keane, T. M. (1997). *Clinician Administered PTSD Scale (rev.)*. Boston, MA: Behavioral Science Division, Boston National Center for Post-traumatic Stress Disorder.

Blanchard, E. B., Hickling, E. J., Malta, L. S., Jaccard, J., Devineni, T., Veazey, C. H., et al. (2003). Prediction of response to psychological treatment among motor vehicle accident survivors with PTSD. *Behavior Therapy, 34*(3), 351-363.

Boeschen, L. E., Koss, M. P., Figueredo, A. J., & Coan, J. A. (2001). Experiential avoidance and post-traumatic stress disorder: A cognitive mediational model of rape recovery. *Journal of Aggression, Maltreatment & Trauma, 4*(2), 211-245.

Bradley, R., Greene, J., Russ, E., Dutra, L., & Westen, D. (2005). A multidimensional meta-analysis of psychotherapy for PTSD. *American Journal of Psychiatry, 162*(2), 214-227.

Brady, K., Pearlstein, T., Asnis, G. M., Baker, D., Rothbaum, B., Sikes, C. R., et al. (2000). Efficacy and safety of sertraline treatment of posttraumatic stress disorder: A randomized controlled trial. *JAMA: Journal of the American Medical Association, 283*(14), 1837-1844.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68*(5), 748-766.

Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. *Psychological Review, 103*(4), 670-686.

Bryant, R. A., Moulds, M. L., Guthrie, R. M., Dang, S. T., & Nixon, R. D. V. (2003). Imaginal exposure alone and imaginal exposure with cognitive restructuring in treatment of posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 71*(4), 706-712.

Cahill, S. E., Foa, E. B., & Taylor, S. (2004). A glass half empty or half full? Where we are and directions for future research in the treatment of PTSD. In S. Taylor (Ed.), *Advances in*

the treatment of posttraumatic stress disorder: Cognitive-behavioral perspectives (pp. 267-313). New York: Springer.

Carson, D., Grubaugh, A., & Resick, P. (2002). Gender and PTSD treatment: Efficacy and effectiveness. In R. Kimerling, P. Ouimette & J. Wolfe (Eds.), *Gender and PTSD* (pp. 305-334). New York: Guilford.

Cattell, R. B., & Scheier, I. H. (1963). *Handbook of the IPAT Anxiety Scale Questionnaire*. Champaign, IL: Institute of Personality and Ability Testing.

Chambless, D. L., Baker, M. J., Baucom, D. H., E, B. L., Calhoun, K. S., Crits-Christoph, P., et al. (1998). Update of empirically validated therapies, II. *The Clinical Psychologist, 51*(1), 3-16.

Chard, K. M. (2005). An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. *Journal of Consulting and Clinical Psychology, 73*(5), 965-971.

Chemtob, C. M., Roitblat, H. L., Hamada, R. S., & Carlson, J. G. (1988). A cognitive action theory of Post-Traumatic Stress Disorder. *Journal of Anxiety Disorders, 2*(3), 253-275.

Chemtob, C. M., Tolin, D. F., van der Kolk, B. A., Pitman, R. K., Foa, E. B., Keane, T. M., et al. (2000). Eye movement desensitization and reprocessing. In *Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies.* (pp. 139-154): Guilford Press.

Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: A phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology, 70*(5), 1067-1074.

Cohen, L. J., & Roth, S. (1987). The psychological aftermath of rape: Long-term effects and individual differences in recovery. *Journal of Social & Clinical Psychology, 5*(4), 525-534.

Connor, K. M., Sutherland, S. M., Tupler, L. A., Malik, M. L., & Davidson, J. R. T. (1999). Fluoxetine in post-traumatic stress disorder: Randomised, double-blind study. *British Journal of Psychiatry, 175*, 17-22.

Creamer, M., Burgess, P., & McFarlane, A. C. (2001). Post-traumatic stress disorder: Findings from the Australian National Survey of Mental Health and Well-Being. *Psychological Medicine, 31*(7), 1237-1247.

Creamer, M., Burgess, P., & Pattison, P. (1992). Reaction to trauma: A cognitive processing model. *Journal of Abnormal Psychology, 101*(3), 452-459.

Davidson, J. R. T., Rothbaum, B. O., van der Kolk, B. A., Sikes, C. R., & Farfel, G. M. (2001). Multicenter, double-blind comparison of sertraline and placebo in the treatment of posttraumatic stress disorder. *Archives of General Psychiatry, 58*(5), 485-492.

Devilly, G. J., & Spence, S. H. (1999). The relative efficacy and treatment distress of EMDR and a cognitive-behavior trauma treatment protocol in the amelioration of posttraumatic stress disorder. *Journal of Anxiety Disorders, 13*(1), 131-157.

Devilly, G. J., Spence, S. H., & Rapee, R. M. (1998). Statistical and reliable change with eye movement desensitization and reprocessing: Treating trauma within a veteran population. *Behavior Therapy, 29*(3), 435-455.

Dunmore, E., Clark, D. M., & Ehlers, A. (1999). Cognitive factors involved in the onset and maintenance of posttraumatic stress disorder (PTSD) after physical or sexual assault. *Behaviour Research and Therapy, 37*(9), 809-829.

Ehlers, A., Clark, D. M., Dunmore, E., Jaycox, L., Meadows, E., & Foa, E. B. (1998). Predicting response to exposure treatment in PTSD: The role of mental defeat and alienation. *Journal of Traumatic Stress, 11*(3), 457-471.

Ehlers, A., Clark, D. M., Hackmann, A., McManus, F., & Fennell, M. (2005). Cognitive therapy for post-traumatic stress disorder: Development and evaluation. *Behaviour Research and Therapy, 43*(4), 413-431.

Faul, F., & Erdfelder, E. (1992). GPOWER: A priori, post-hoc, and compromise power analyses for MS-DOS (Version 2.0) [Computer software]. Bonn, FRG: Bonn University, Department of Psychology.

Feeny, N. C., Zoellner, L. A., & Foa, E. B. (2002). Treatment outcome for chronic PTSD among female assault victims with borderline personality characteristics: A preliminary examination. *Journal of Personality Disorders, 16*(1), 30-40.

First, M. B., Spitzer, R. L., M, G., & Williams, J. B. W. (1996). *Structured Clinical Interview for DSM-IV Axis I Disorders-NonPatient Edition (SCID-I/NP, Version 2.0)*. New York: Biometrics Research Department, New York State Psychiatric Institute.

Foa, E. B., Dancu, C. V., Hembree, E. A., Jaycox, L. H., Meadows, E. A., & Street, G. P. (1999). A comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. *Journal of Consulting and Clinical Psychology, 67*(2), 194-200.

Foa, E. B., Hembree, E. A., Cahill, S. P., Rauch, S. A. M., Riggs, D. S., Feeny, N. C., et al. (2005). Randomized trial of prolonged exposure for posttraumatic stress disorder with and without cognitive restructuring: Outcome at academic and community clinics. *Journal of Consulting and Clinical Psychology, 73*(5), 953-964.

Foa, E. B., Huppert, J. D., & Cahill, S. P. (2006). Emotional processing theory: An update. In B. O. Rothbaum (Ed.), *Pathological anxiety: Emotional processing in etiology and treatment.* (pp. 3-24). New York: Guilford Press.

Foa, E. B., Keane, T. M., & Friedman, M. J. (2000). *Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies*: Guilford Press.

Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin, 99*(1), 20-35.

Foa, E. B., & Rauch, S. A. M. (2004). Cognitive Changes During Prolonged Exposure Versus Prolonged Exposure Plus Cognitive Restructuring in Female Assault Survivors With Posttraumatic Stress Disorder. *Journal of Consulting and Clinical Psychology, 72*(5), 879-884.

Foa, E. B., Riggs, D. S., Dancu, C. V., & Rothbaum, B. O. (1993). Reliability and validity of a brief instrument for assessing post-traumatic stress disorder. *Journal of Traumatic Stress, 6*(4), 459-473.

Foa, E. B., Riggs, D. S., Massie, E. D., & Yarczower, M. (1995). The impact of fear activation and anger on the efficacy of exposure treatment for posttraumatic stress disorder. *Behavior Therapy, 26*(3), 487-499.

Foa, E. B., & Rothbaum, B. O. (1998). *Treating the trauma of rape: Cognitive-behavioral therapy for PTSD*: Guilford Press.

Foa, E. B., Rothbaum, B. O., Riggs, D. S., & Murdock, T. B. (1991). Treatment of posttraumatic stress disorder in rape victims: A comparison between cognitive-behavioral procedures and counseling. *Journal of Consulting and Clinical Psychology, 59*(5), 715-723.

Foa, E. B., Steketee, G., & Rothbaum, B. O. (1989). Behavioral/cognitive conceptualizations of post-traumatic stress disorder. *Behavior Therapy, 20*(2), 155-176.

Follette, V. M., Polusny, M. A., Bechtle, A. E., & Naugle, A. E. (1996). Cumulative trauma: The impact of child sexual abuse, adult sexual assault, and spouse abuse. *Journal of Traumatic Stress, 9*(1), 25-35.

Forbes, D., Creamer, M., Hawthorne, G., Allen, N., & McHugh, T. (2003). Comorbidity as a predictor of symptom change after treatment in combat-related posttraumatic stress disorder. *Journal of Nervous and Mental Disease, 191*(2), 93-99.

Ford, J. D., & Kidd, P. (1998). Early childhood trauma and disorders of extreme stress as predictors of treatment outcome with chronic posttraumatic stress disorder. *Journal of Traumatic Stress, 11*(4), 743-761.

Gillespie, K., Duffy, M., Hackmann, A., & Clark, D. M. (2002). Community-based cognitive therapy in the treatment of post-traumatic stress disorder following the Omagh bomb. *Behaviour Research and Therapy, 40*(4), 345-357.

Girelli, S. A., Resick, P. A., Marhoefer-Dvorak, S., & Hutter, C. K. (1986). Subjective distress and violence during rape: Their effects on long-term fear. *Violence and Victims, 1*(1), 35-46.

Grayson, J. B., Foa, E. B., & Steketee, G. S. (1986). Exposure in vivo of obsessive-compulsives under distracting and attention-focusing conditions: Replication and extension. *Behaviour Research and Therapy, 24*(4), 475-479.

Harvey, A. G. (1999). Psychological approaches to the treatment of posttraumatic stress disorder. In E. J. Hickling & E. B. Blanchard (Eds.), *The international handbook of road traffic*

accidents & psychological trauma: Current understanding, treatment and law. (pp. 341-352): Elsevier Science.

Hembree, E. A., Cahill, S. P., & Foa, E. B. (2004). Impact of personality disorders on treatment outcome for female assault survivors with chronic Posttraumatic Stress Disorder. *Journal of Personality Disorders, 18*(1), 117-127.

Hembree, E. A., Marshall, R. D., Fitzgibbons, L. A., Foa, E. B., Dewan, M. J., & Pies, R. W. (2001). The difficult-to-treat patient with posttraumatic stress disorder. In *The difficult-to-treat psychiatric patient.* (pp. 149-178): American Psychiatric Publishing, Inc.

Hembree, E. A., Street, G. P., Riggs, D. S., & Foa, E. B. (2004). Do assault-related variables predict response to cognitive behavioral treatment for PTSD? *Journal of Consulting and Clinical Psychology, 72*(3), 531-534.

Herman, J. L. (1992). *Trauma and recovery*: Basic Books Inc.

Horowitz, M. J. (1976). *Stress response syndromes*: Jason Aronson.

Hyer, L., Braswell, L., Albrecht, B., Boyd, S., Boudewyns, P., & Talbert, S. (1994). Relationship of NEO-PI to personality styles and severity of trauma in chronic PTSD victims. *Journal of Clinical Psychology, 50*(5), 699-707.

Hyler, S. E., & Rieder, R. O. (1987). *Personality Diagnostic Questionnaire--Revised (PDQ-R)*.

Ironson, G., Freud, B., Strauss, J. L., & Williams, J. (2002). Comparison for two treatments for traumatic stress: A community-based study of EMDR and prolonged exposure. *Journal of Clinical Psychology, 58*(1), 113-128.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*(1), 12-19.

Jaycox, L. H., Foa, E. B., & Morral, A. R. (1998). Influence of emotional engagement and habituation on exposure therapy for PTSD. *Journal of Consulting and Clinical Psychology, 66*(1), 185-192.

Johnstone, K. A., & Page, A. C. (2004). Attention to phobic stimuli during exposure: The effect of distraction on anxiety reduction, self-efficacy and perceived control. *Behaviour Research and Therapy, 42*(3), 249-275.

Jones, J. C., & Barlow, D. H. (1990). The etiology of posttraumatic stress disorder. *Clinical Psychology Review, 10*(3), 299-328.

Kardiner, A. (1941). *The traumatic neuroses of war*: National Research Council.

Keane, T. M., Fairbank, J. A., Caddell, J. M., & Zimering, R. T. (1989). Implosive (flooding) therapy reduces symptoms of PTSD in Vietnam combat veterans. *Behavior Therapy, 20*(2), 245-260.

Keane, T. M., Weathers, F. W., Foa, E. B., Foa, E. B., Keane, T. M., & Friedman, M. J. (2000). Diagnosis and assessment. In *Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies.* (pp. 18-36): Guilford Press.

Keane, T. M., Zimering, R. T., & Caddell, J. M. (1985). A behavioral formulation of posttraumatic stress disorder in Vietnam veterans. *Behavior Therapist, 8*(1), 9-12.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52*(12), 1048-1060.

Kilpatrick, D. G., Saunders, B. E., Amick-McMullan, A., & Best, C. L. (1989). Victim and crime factors associated with the development of crime-related post-traumatic stress disorder. *Behavior Therapy, 20*(2), 199-214.

Knezevic, G., Opacic, G., Savic, D., & Priebe, S. (2005). Do personality traits predict post-traumatic stress?: A prospective study in civilians experiencing air attacks. *Psychological Medicine, 35*(5), 659-663.

Kolb, L. C. (1987). A neuropsychological hypothesis explaining posttraumatic stress disorders. *American Journal of Psychiatry, 144*(8), 989-995.

Krakow, B., Hollifield, M., Johnston, L., Koss, M., Schrader, R., Warner, T. D., et al. (2001). Imagery rehearsal therapy for chronic nightmares in sexual assault survivors with posttraumatic stress disorder: A randomized controlled trial. *JAMA: Journal of the American Medical Association, 286*(5), 537-545.

Krystal, J. H., Southwick, S. M., Charney, D. S., & Schacter, D. L. (1995). Post Traumatic Stress Disorder: Psychobiological mechanisms of traumatic remembrance. In *Memory distortions: How minds, brains, and societies reconstruct the past.* (pp. 150-172): Harvard University Press.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.

Leiner, A. S., Jackson, J. L., Astin, M. C., & Rothbaum, B. O. (2006). *Symptom change patterns during prolonged exposure and EMDR treatments for PTSD following rape*.Unpublished manuscript.

Littleton, H., & Breitkopf, C. R. (2006). Coping with the experience of rape. *Psychology of Women Quarterly, 30*(1), 106-116.

Litz, B. T., & Keane, T. M. (1989). Information processing in anxiety disorders: Application to the understanding of post-traumatic stress disorder. *Clinical Psychology Review, 9*(2), 243-257.

Livanou, M., Basoglu, M., Marks, I. M., De Silva, P., Noshirvani, H., Lovell, K., et al. (2002). Beliefs, sense of control and treatment outcome in post-traumatic stress disorder. *Psychological Medicine, 32*(1), 157-165.

Marks, I., Lovell, K., Noshirvani, H., Livanou, M., & Thrasher, S. (1998). Treatment of posttraumatic stress disorder by exposure and/or cognitive restructuring: A controlled study. *Archives of General Psychiatry, 55*(4), 317-325.

Marshall, R. D., Beebe, K. L., Oldham, M., & Zaninelli, R. (2001). Efficacy and safety of paroxetine treatment for chronic PTSD: A fixed-dose, placebo-controlled study. *American Journal of Psychiatry, 158*(12), 1982-1988.

Martenyi, F., Brown, E. B., Zhang, H., Koke, S. C., & Prakash, A. (2002). Fluoxetine v. placebo in prevention of relapse in post-traumatic stress disorder. *British Journal of Psychiatry, 181*(4), 315-320.

McFarlane, A. C. (1988). The phenomenology of posttraumatic stress disorders following a natural disaster. *Journal of Nervous and Mental Disease, 176*(1), 22-29.

Munley, P. H., Bains, D. S., Frazee, J., & Schwartz, L. T. (1994). Inpatient PTSD treatment: A study of pretreatment measures, treatment dropout, and therapist ratings of response to treatment. *Journal of Traumatic Stress, 7*(2), 319-325.

Oliver, N. S., & Page, A. C. (2003). Fear reduction during in vivo exposure to blood-injection stimuli: Distraction vs. attentional focus. *British Journal of Clinical Psychology, 42*(1), 13-25.

Paunovic, N., & Öst, L.-G. (2001). Cognitive-behavior therapy vs exposure therapy in the treatment of PTSD in refugees. *Behaviour Research and Therapy, 39*(10), 1183-1197.

Perconte, S. T., & Griger, M. L. (1991). Comparison of successful, unsuccessful, and relapsed Vietnam veterans treated for posttraumatic stress disorder. *Journal of Nervous and Mental Disease, 179*(9), 558-562.

Pitman, R. K., Orr, S. P., Altman, B., & Longpre, R. E. (1996). Emotional processing and outcome of imaginal flooding therapy in Vietnam Veterans with chronic posttraumatic stress disorder. *Comprehensive Psychiatry, 37*(6), 409-418.

Raudenbush, S., Bryk, A., & Congdon, R. (2005). Hierarchical Linear and Nonlinear Modeling (Version 6.02a) [Computer software]. Lincolnwood, IL: Scientific Software International.

Resick, P. A., Nishith, P., Weaver, T. L., Astin, M. C., & Feuer, C. A. (2002). A comparison of cognitive-processing therapy with prolonged exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape victims. *Journal of Consulting and Clinical Psychology, 70*(4), 867-879.

Riggs, D. S., Dancu, C. V., Gershuny, B. S., & Greenberg, D. (1992). Anger and post-traumatic stress disorder in female crime victims. *Journal of Traumatic Stress, 5*(4), 613-625.

Rodriguez, B. I., & Craske, M. G. (1993). The effects of distraction during exposure to phobic stimuli. *Behaviour Research and Therapy, 31*(6), 549-558.

Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American Psychologist, 41*(7), 813-819.

Roth, S., Newman, E., Pelcovitz, D., van der Kolk, B., & Mandel, F. S. (1997). Complex PTSD in victims exposed to sexual and physical abuse: Results from the DSM-IV field trial for posttraumatic stress disorder. *Journal of Traumatic Stress, 10*(4), 539-555.

Rothbaum, B. O. (1997). A controlled study of eye movement desensitization and reprocessing in the treatment of posttraumatic stress disordered sexual assault victims. *Bulletin of the Menninger Clinic, 61*(3), 317-334.

Rothbaum, B. O. (2001, November). *Prolonged exposure versus EMDR for PTSD rape victims. In P. A. Resick (Chair), Three clinical trials for the treatment of PTSD: Outcome and dissemination.* Paper presented at the annual convention of the Association for the Advancement of Behavior Therapy, Philadelphia, PA.

Rothbaum, B. O., & Astin, M. C. (2001, December). *Prolonged exposure vs. EMDR for PTSD rape victims. In B. O. Rothbaum (Chair), 3 Controlled trials for PTSD: PE compared to 1) EMDR; 2) CPT; and 3) CR.* Paper presented at the annual meeting of the International Society of Traumatic Stress Studies, New Orleans, LA.

Rothbaum, B. O., Astin, M. C., & Marsteller, F. A. (2005). Prolonged Exposure Versus Eye Movement Desensitization and Reprocessing (EMDR) for PTSD Rape Victims. *Journal of Traumatic Stress, 18*(6), 607-616.

Rothbaum, B. O., Foa, E. B., Riggs, D. S., & Murdock, T. (1992). A prospective examination of post-traumatic stress disorder in rape victims. *Journal of Traumatic Stress, 5*(3), 455-475.

Rothbaum, B. O., Meadows, E. A., Resick, P., Foy, D. W., Foa, E. B., Keane, T. M., et al. (2000). Cognitive-behavioral therapy. In *Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies.* (pp. 60-83): Guilford Press.

Santello, M. D., & Leitenberg, H. (1993). Sexual aggression by an acquaintance: Methods of coping and later psychological adjustment. *Violence and Victims, 8*(2), 91-104.

Selvig, A. L. (2004). *Analyzing individual patterns of change in two treatments for posttraumatic stress disorder.* Unpublished master's thesis, University of Georgia, Athens, Georgia.

Selvig, A. L., Rothbaum, B. O., Jackson, J. L., & Astin, M. C. (2004a, March). *Comparing Symptom Exacerbation in PTSD during prolonged exposure and eye movement desensitization and reprocessing.* Paper presented at the annual convention of the Anxiety Disorders Association of America, Miami, FL.

Selvig, A. L., Rothbaum, B. O., Jackson, J. L., & Astin, M. C. (2004b, November). *Symptom change patterns during prolonged exposure and EMDR treatments for PTSD following sexual assault.* Paper presented at the annual convention of the Advancement of Behavior Therapy, New Orleans, LA.

Selvig, A. L., Rothbaum, B. O., Jackson, J. L., & Astin, M. C. (2004c, March). *Validity of the Posttraumatic Congnitions Scale (PTCI) as an outcome measure of PTSD-related congnitions.* Paper presented at the annual convention of the Anxiety Disorders Association of America, Miami, FL.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Traite Anxiety Inventory*. Palo Alto, CA: Consulting Psychologist Press.

Spitzer, R. L., Williams, J. B., Gibbon, M., & First, M. B. (1987). *Structured clinical interview for DSM-III-R personality disorders (SCID-II)*. Washington, DC: American Psychiatric Press.

Steketee, G., & Chambless, D. L. (1992). Methodological issues in prediction of treatment outcome. *Clinical Psychology Review, 12*(4), 387-400.

Stewart, S. H., Pihl, R. O., Conrod, P. J., & Dongier, M. (1998). Functional associations among trauma, PTSD and substance-related disorders. *Addictive Behaviors, 23*(6), 797-812.

Tarrier, N., Pilgrim, H., Sommerfield, C., Faragher, B., Reynolds, M., Graham, E., et al. (1999). A randomized trial of cognitive therapy and imaginal exposure in the treatment of chronic posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology, 67*(1), 13-18.

Tarrier, N., Sommerfield, C., Connell, J., Deakin, B., Pilgrim, H., & Reynolds, M. (2002). The psychophysiological responses of PTSD patients: Habituation, responses to stressful and neutral vignettes and association with treatment outcome. *Behavioural and Cognitive Psychotherapy, 30*(2), 129-142.

Tarrier, N., Sommerfield, C., & Pilgrim, H. (1999). Relatives' expressed emotion (EE) and PTSD treatment outcome. *Psychological Medicine, 29*(4), 801-811.

Tarrier, N., Sommerfield, C., Pilgrim, H., & Faragher, B. (2000). Factors associated with outcome of cognitive-behavioural treatment of chronic post-traumatic stress disorder. *Behaviour Research and Therapy, 38*(2), 191-202.

Taylor, J. A. (1953). A personality scale of manifest anxiety. *Journal of Abnormal & Social Psychology, 48*, 285-290.

Taylor, S. (2003). Outcome Predictors for Three PTSD Treatments: Exposure Therapy, EMDR, and Relaxation Training. *Journal of Cognitive Psychotherapy, 17*(2), 149-161.

Taylor, S., Fedoroff, I. C., Koch, W. J., Thordarson, D. S., Fecteau, G., & Nicki, R. M. (2001). Posttraumatic stress disorder arising after road traffic collisions: Patterns of response to cognitive-behavior therapy. *Journal of Consulting and Clinical Psychology, 69*(3), 541-551.

Telch, M. J., Valentiner, D. P., Ilai, D., Young, P. R., Powers, M. B., & Smits, J. A. J. (2004). Fear activation and distraction during the emotional processing of claustrophobic fear. *Journal of Behavior Therapy and Experimental Psychiatry, 35*(3), 219-232.

Tobin, D. L., Holroyd, K. A., Reynolds, R. V., & Wigal, J. K. (1989). The hierarchical factor structure of the Coping Strategies Inventory. *Cognitive Therapy and Research, 13*(4), 343-361.

Tucker, P., Zaninelli, R., Yehuda, R., Ruggiero, L., Dillingham, K., & Pitts, C. D. (2001). Paroxetine in the treatment of chronic posttraumatic stress disorder: Results of a placebo-controlled, flexible-dosage trial. *Journal of Clinical Psychiatry, 62*(11), 860-868.

Valentiner, D. P., Foa, E. B., Riggs, D. S., & Gershuny, B. S. (1996). Coping strategies and posttraumatic stress disorder in female victims of sexual and nonsexual assault. *Journal of Abnormal Psychology, 105*(3), 455-458.

van der Kolk, B. A., Dreyfuss, D., Michaels, M., Shera, D., Berkowitz, R., Fisler, R. E., et al. (1994). Fluoxetine in posttraumatic stress disorder. *Journal of Clinical Psychiatry, 55*(12), 517-522.

van der Kolk, B. A., Pelcovitz, D., Roth, S., & Mandel, F. S. (1996). Dissociation, somatization, and affect dysregulation: The complexity of adaption to trauma. *American Journal of Psychiatry, 153*, 83-93.

van Minnen, A., Arntz, A., & Keijsers, G. P. J. (2002). Prolonged exposure in patients with chronic PTSD: Predictors of treatment outcome and dropout. *Behaviour Research and Therapy, 40*(4), 439-457.

Vaughan, K., Armstrong, M. S., Gold, R., & O'Connor, N. (1994). A trial of eye movement desensitization compared to image habituation training and applied muscle relaxation in

post-traumatic stress disorder. *Journal of Behavior Therapy and Experimental Psychiatry, 25*(4), 283-291.

Waltz, J., Addis, M. E., Koerner, K., & Jacobson, N. S. (1993). Testing the integrity of a psychotherapy protocol: Assessment of adherence and competence. *Journal of Consulting and Clinical Psychology, 61*(4), 620-630.

Wilson, S. A., Becker, L. A., & Tinker, R. H. (1995). Eye movement desensitization and reprocessing (EMDR) treatment for psychologically traumatized individuals. *Journal of Consulting and Clinical Psychology, 63*(6), 928-937.

Table 1. Demographic Characteristics of Participants.

Characteristic		Treatment Status	
		Initiated	Completed
		n = 62	*n* = 53
Age, years, *M (SD)*		34.7 (11.3)	34.7 (11.1)
Time since Trauma, months, *M (SD)*		151.9 (134.1)	148.8 (128.9)
†Race,	African American	25.8%	20.8%
% of Total Sample	Caucasian	67.7%	71.7%
	Latina	3.2%	3.8%
	Other	3.2%	3.8%
Education,	Doctoral Degree	3.2%	3.8%
% of Total Sample	Masters Degree	9.7%	11.3%
	Some Graduate School	11.3%	11.3%
	College Graduate	19.4%	22.6%
	Some College	35.5%	34.0%
	High School Graduate	19.4%	17.0%
	Some High School	1.6%	0.0%
Martial Status,	Single	48.4%	50.9%
% of Total Sample	Married	25.8%	26.4%
	Living Together	1.6%	0.0%
	Divorced or Separated	24.2%	22.6%
Number of Children, *M (SD)*		0.7 (1.1)	0.6 (1.1)
Employment Status,	Not Working	19.4%	22.6%
% of Total Sample	Working, Part Time	16.1%	17.0%
	Working, Full Time	46.8%	41.5%
	Working at Home	3.2%	1.9%
	Student	14.5%	17.0%
Household Income,	Greater than $40,000	27.5%	28.3%
% of Total Sample	$20,000 - $40,000	30.7%	32.1%
	Less than $20,000	41.9%	39.6%

Note. Percentages do not add up to 100 due to rounding errors. †Participants indicated if their racial background was African American, Caucasian, Latina, Asian, American Indian, or Other.

Table 2. Psychopathology Measures.

Scale	Pretreatment		Posttreament	
	n	*M (SD)*	*n*	*M (SD)*
CSI-Disengagement	61	100.4 (29.6)	52	65.0 (22.0)
PSS-SR	62		53	
Total		27.0 (9.2)		9.2 (9.8)
Reexperiencing		6.6 (3.3)		1.7 (2.6)
Avoid & Numb		11.5 (4.5)		4.1 (4.9)
Hyperarousal		8.9 (3.2)		3.3 (3.5)
CAPS	62		53	
Total		71.1 (19.2)		27.5 (22.8)
Reexperiencing		19.5 (7.4)		5.3 (7.1)
Avoid & Numb		28.8 (10.3)		11.2 (11.2)
Hyperarousal		22.8 (6.3)		10.9 (7.7)
BDI-II	62	21.6 (9.5)	53	8.2 (9.6)
STAI				
State Anxiety	60	46.7 (12.6)	51	31.2 (10.9)
Trait Anxiety	60	52.5 (11.5)	50	37.8 (12.4)

Note. CSI = Coping Skills Inventory. PSS-SR = PTSD Symptom Scale-Self Report. CAPS = Clinician Administered PTSD Scale. BDI-II = Beck Depression Inventory (revised). STAI = State-Trait Anxiety Inventory.

Table 3. Summary of Hierarchical Regression Analysis for Variables Predicting Posttreatment PSS-SR Scale Scores (N = 52).

Posttreatment Symptom Scale Pretreatment Predictor	*B*	*SE B*	*β*	ΔR^2
Total				
Step 1				.10*
Total Symptoms	0.33	0.14	0.32*	
Step 2				.08*
Total Symptoms	0.45	0.14	0.45**	
Avoidance Coping	-0.11	0.05	-0.31*	
Step 3				.01
Total Symptoms	0.44	0.15	0.43**	
Avoidance Coping	-0.01	0.05	-0.29*	
Avoidance Coping*Treatment Group	-0.02	0.03	-0.12	
Reexperiencing				
Step 1				.05
Reexperiencing Symptoms	0.27	0.10	0.26	
Step 2				.08
Reexperiencing Symptoms	0.23	0.10	0.30*	
Avoidance Coping	-0.02	0.01	-0.22	
Step 3				.01
Total Symptoms	0.22	0.10	0.29*	
Avoidance Coping	-0.09	0.01	-0.20	
Avoidance Coping*Treatment Group	<0.01	0.01	-0.09	
Avoidance & Numbing				
Step 1				.16**
Avoidance & Numbing Symptoms	0.41	0.14	0.39**	
Step 2				.13**
Avoidance & Numbing Symptoms	0.61	0.14	0.59***	
Avoidance Coping	-0.07	0.02	-0.41**	
Step 3				.02
Total Symptoms	0.59	0.14	0.57***	
Avoidance Coping	-0.07	0.02	-0.38**	
Avoidance Coping*Treatment Group	-0.01	0.01	-0.14	

Table 3. (Continued).

Posttreatment Symptom Scale Pretreatment Predictor	*B*	*SE B*	*β*	ΔR^2
Hyperarousal				
Step 1				.09*
Reexperiencing Symptoms	0.34	0.14	0.32*	
Step 2				.10
Reexperiencing Symptoms	0.39	0.15	0.38**	
Avoidance Coping	-0.02	0.02	-0.17	
Step 3				<.01
Total Symptoms	0.39	0.15	0.37**	
Avoidance Coping	-0.02	0.02	-0.16	
Avoidance Coping*Treatment Group	0.00	0.01	-0.06	
Total Symptoms (Exploratory Analysis)				
Step 1				.10*
Avoidance and Numbing Symptoms	0.65	0.28	0.31*	
Step 2				.10*
Avoidance and Numbing Symptoms	1.00	0.31	0.48**	
Avoidance Coping	-0.12	0.05	-0.36*	

Note. PSS-SR = Posttraumatic Symptom Scale-Self Report.
*$p < .05$, **$p < .01$, ***$p < .001$.

Table 4. Correlations between the CSI Disengagement Scale and the PSS-SR Scales (N =52).

Scale	1	2	3	4	5	6	7	8	9
CSI Disengagement Subcale									
1. PreTx	--								
2. PostTx	.46***	--							
PSS-SR									
3. Total: PreTx	.41**	.21	--						
4. Total: PostTx	-.13	.48***	.32*	--					
5. Reexperiencing: PreTx	.18	.05	.81***	.18	--				
6. Reexperiencing: PostTx	-.16	.41**	.28*	.81***	.26	--			
7. Avoidance & Numbing: PreTx	.47***	.32*	.82***	.31*	.41**	.15	--		
8. Avoidance & Numbing: PostTx	-.13	.45***	.27	.92***	.04	.60***	.39**	--	
9. Hyperarousal: PreTx	.30*	.10	.86***	.29*	.65***	.29*	.54***	.19	--
10. Hyperarousal: PostTx	-.06	.39**	.31*	.90***	.25	.68***	.20	.71***	.32*

Note. CSI = Coping Scales Inventory. PSS-SR = Posttraumatic Symptom Scale-Self Report. PreTx = Pretreatment. PostTx = Posttreatment. *$p < .05$, **$p < .01$, ***$p < .001$.

Table 5. Results of Fitting Hierarchical Linear Models to PSS-SR Scales over Treatment Sessions.

Effect		PSS-SR Scale			
		Total	Reexperiencing	Avoidance & Numbing	Hyperarousal
Fixed Effects					
Intercept (pretreatment status)	γ_{00}	14.074***	3.623*	4.611*	5.876***
		(4.718)	(1.717)	(2.213)	(1.610)
Avoidant Coping on Intercept	γ_{01}	0.152**	0.037*	0.079***	0.035*
		(0.045)	(0.016)	(0.021)	(0.015)
SESSION (linear term)	γ_{10}	0.174	-0.060	0.237	-0.014
		(0.594)	(0.190)	(0.260)	(0.211)
Avoidant Coping on Linear Term	γ_{11}	-0.021***	-0.004*	-0.011***	-0.006***
		(0.006)	(0.002)	(0.003)	(0.002)
Variance Components					
Level 1 *Within Person*	σ_{ε}^2	30.588***	4.917***	5.795***	4.080***
Level 2					
In Pretreatment Status	τ_0^2	96.331***	12.491***	21.514***	10.965***
Linear Term					
Variance	τ_1^2	1.194***	0.109***	0.229***	0.146***
Covar with Intercept	τ_{01}	-5.104	-0.807	1.001	-0.555

Note. PSS-SR = Posttraumatic Symptom Scale-Self Report. Values in parentheses are standard errors. Covariances were not tested for significance. *p < .05, **p < .01, ***p < .001.

Table 6. Logistic Regression Analyses for Prediction of Posttreatment Diagnostic Status (N = 52) and Dropout (N = 61).

Dependent Variable							
Posttreatment Dx of PTSD	*β*	*SE β*	Wald's χ^2	*df*	*p*	e^{β} (odds ratio)	95% *CI*
Predictor							
Constant	-1.040	1.384	0.565	1	.45	N/A	N/A
Pretreatment							
Avoidant Coping[1]	-0.007	0.014	0.241	1	.62	0.99	0.98-1.02
Test			χ^2	*df*	*p*		
Overall model: Likelihood ratio test			0.224	1	.62		
Goodness of fit[2]			2.436	8	.97		
Dropout	*β*	*SE β*	Wald's χ^2	*df*	*p*	e^{β} (odds ratio)	95% *CI*
Predictor							
Constant	-1.824	1.291	1.998	1	.16	N/A	N/A
Pretreatment							
Avoidant Coping[1]	0.001	0.012	0.003	1	.96	1.00	0.98-1.03
Test			χ^2	*df*	*p*		
Overall model: Likelihood ratio test			0.003	1	.96		
Goodness of fit[1]			6.592	8	.58		

[1]Avoidant coping was measured with the Disengagement Subscale of the Coping Strategies Inventory.

[2]Goodness of fit refers to the Hosmer & Lemeshow test.

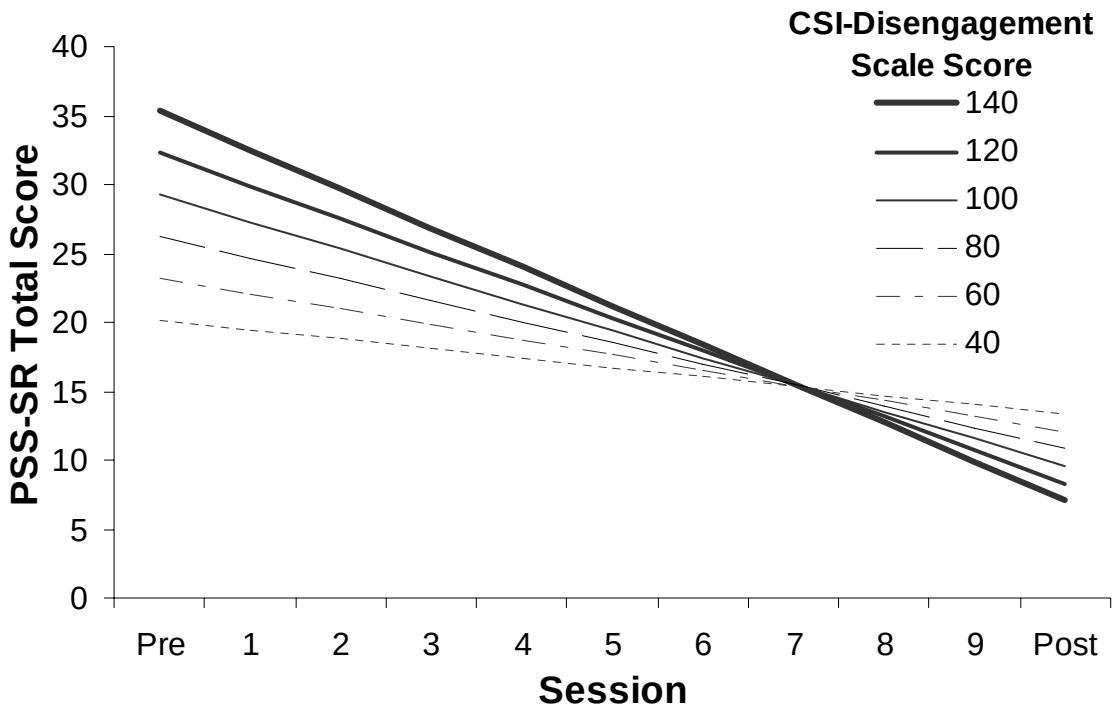

Figure 1. Conceptual model demonstrating how the Coping Strategies Inventory-Disengagement Subscale (CSI-DS) is related to the rate of symptom change during treatment.