AN INVESTIGATION OF THE EFFICACY OF EMPIRICALLY SUPPORTED

TREATMENTS (ESTS) FOR POSTTRAUMATIC STRESS DISORDER (PTSD):

A META-ANALYTIC REVIEW

A DISSERTATION

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DEDICATION

This dissertation is dedicated with love to Andrew Jordan Shainker.

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ABSTRACT

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Posttraumatic stress disorder (PTSD) is a psychological disorder that occurs

following a psychological trauma, which consists of experiencing or witnessing a life-

threatening situation. Examples of traumatic events include, but are not limited to,

natural disasters, rape or sexual assault, and combat. Symptoms of PTSD often include

symptoms of avoiding triggers or memories of the traumatic event, intrusive thoughts

regarding the traumatic event, disturbances in cognition and mood, and hyperarousal.   In

an effort to evaluate effective treatments for a variety of psychological disorder, Division

12 (Clinical Psychology) of the American Psychological Association (APA) created a

task force for evaluating empirically supported treatments (ESTs). ESTs often offer

manualized treatment protocols that are disorder specific. In their review of treatments,

the APA presidential task force reviewed 7 treatments for PTSD, including Cognitive

Processing Therapy (CPT), Present Centered Therapy (PCT), Prolonged Exposure (PE),

Eye Movement Desensitization and Reprocessing (EMDR), Stress Inoculation Training

(SIT), Seeking Safety, and Psychological Debriefing. While the APA task force of ESTs

has identified 6 effective treatments for PTSD, to date, there has not been a meta-analysis

conducted examining the efficacy of these treatments in comparison to one another. This dissertation aims to fill this gap in the literature by conducting a meta-analysis on PTSD-related treatment outcomes by each of these treatment protocols. Due to the unique nature of Seeking Safety, it was not included in this analysis. Furthermore, due to limited number of obtained studies, SIT was also excluded from this analysis. Utilizing both random and mixed effects meta-analysis models, this study found that CPT had significantly greater treatment outcomes compared to EMDR and PCT. CPT outcomes did not significantly differ from PE outcomes. Further moderation analysis found that veteran participants tended have a greater treatment response to CPT and PE compared to civilian participants. Conversely, civilian participants appeared to have greater symptom reduction following EMDR when compared to veteran populations. Where data were available, results found that PTSD-specific treatments also appear to have a secondary benefit on reducing symptoms of both anxiety and depression. Results from this study build on prior knowledge by providing additional support for the magnitude of efficacy of various treatment modalities. Implications for practice and policy are discussed.

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CHAPTER I

INTRODUCTION

A recent review by Kilpatrick et al. (2013) estimated that upwards of 89.7% of

adults living in the United States have been exposed to a traumatic event during their

lifetime. While definitions of what constitutes a trauma tends to vary, a traumatic event

is defined by the current *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*)

as an "actual or threatened death, serious injury, or sexual violence," and can either be

directly experienced or witnessed (American Psychiatric Association, 2013, p. 271).

Examples of trauma include interpersonal violence (Iverson et al., 2011; Iverson et al.,

2013), natural disaster (Polusny et al., 2011; Wei et al., 2013), and wartime

conflict/combat exposure (Mittal et al., 2013; Wood, Wiederhold, & Spira, 2010).

Exposure to trauma may lead to a variety of negative mental health consequences,

such as depression, anxiety, or somatization (McFarlane, Nava, Gilroy, Paulson, &

Maddoux, 2012). However, exposure to trauma is most often thought of in relation to the

development of posttraumatic stress disorder (PTSD; American Psychiatric Association,

2013). In the United States, it is estimated that between 3.8% and 8.3% of adults (~24.4

million) meet criteria for PTSD (Kilpatrick et al., 2013). Furthermore, exposure to

trauma in the form of violence has been linked to a variety of negative health outcomes

ranging from respiratory problems to cardiovascular problems to rheumatology problems

(Dolezal, McCollum, & Callahan, 2009). Ramchand et al.'s (2010) recent RAND study

estimated that the annual financial burden of PTSD in the United States for just Iraq and Afghanistan Veterans was between 2 and 3.4 billion dollars and others estimate the annual cost of PTSD to be upwards of 23 billion dollars annually (Rosenthal, n.d.).

Given the high prevalence and associated cost of PTSD, most psychologists in clinical practice will likely encounter clients who meet criteria for PTSD over the course of their professional careers, and as such, there has recently been great attention on the treatment of PTSD and other trauma-related disorders. Additionally, there has been a shift within the field of psychology and other health care professions to focus on empirical support for psychological treatments (Goodheart, Kazdin, & Sternberg, 2006). This movement was most evident within the field of psychology through the American Psychological Association's efforts (APA; 2006) and the efforts of the Society of Clinical Psychology (Division 12). Specifically, the Society of Clinical Psychology examined and reviewed current research on the outcomes across various approaches to psychotherapy and the efficacy across disorder. The level of evidence supporting each treatment was evaluated based on the current, available research and treatments were ranked into three categories: weak, modest, strong. Furthermore, treatments that had mixed or insufficient research to support efficacy have been identified as such. Lastly, treatments that appear to have no known benefits or have been associated with risk to participants have been described as potentially harmful.

Specific to PTSD, Hajcak and Starr (n.d.) and Chambless and Hollon (1998) reviewed seven treatments for PTSD. This review included Prolonged Exposure (PE; Foa, Hambree, & Rothbaum, 2007), Present-Centered Therapy (PCT; Classen, Butler, &

Spiegel, 2001), Cognitive Processing Therapy (CPT; Resick & Schnicke, 1996), Seeking

Safety (with co-morbid substance use disorder; Najavits, 2002a), Stress Inoculation

Therapy (SIT; Veronen & Kilpatrick, 1983), Eye-Movement and Desensitization and

Reprocessing (EMDR; Shapiro, 2001), and psychological debriefing (Lewis, 2003).

PE was determined to have strong research support (Hajcak & Starr, n.d.). This

approach to treatment was developed by Foa et al. (2007), and as implied by the name, is

an exposure-based approach to PTSD treatment. This manualized treatment typically

lasts approximately 16 sessions and is delivered in twice-weekly 90-minute individual

sessions. The goal of PE is to have clients experience trauma-related distress to triggers

and memories through both imaginary and *in vivo* exposure as a means to help clients

learn to tolerate and manage distress through habituation.

PCT also has strong research support (Hajcak & Starr, n.d.). This treatment

approach developed by Classen et al. (2001) aims to reduce PTSD symptoms through

addressing maladaptive patterns of behaviors, psychoeducation about PTSD, and

teaching problem solving skills to address current struggles. Unlike other approaches to

PTSD, this treatment does not incorporate exposure or cognitive restructuring. This

approach has been adapted for use in both group and individual modalities, and treatment

length generally last between 12 to 16 sessions, 60-90 minutes each.

Hajcak and Starr (n.d.) determined that CPT had strong research support. This

treatment was developed by Resick and Schnicke (1996) specifically for with working

rape-related PTSD. However, CPT has been expanded for use with other types of trauma

(Monson et al., 2006). The mechanism in which CPT aims to reduce PTSD related

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symptoms is through challenging and changing cognitive distortions and beliefs (e.g., self-blame) through Socratic questioning. While CPT does include an exposure component (i.e., writing the trauma), the primary focus of this treatment is exploring beliefs and meanings attributed to the traumatic event. CPT has been adapted to both group and individual modalities, and typically includes 9-14 sessions, 60-90 minute long.

Seeking Safety is a group treatment for PTSD with co-morbid substance abuse that was developed by Najavits in 2009. This approach also has strong empirical support (Hajcak & Starr, n.d.). The main focus, as implied by the name, is ensuring client safety, and unlike other approaches to both substance abuse and PTSD, this treatment aims to concurrently address both psychological problems.   This approach to treatment also tends to focus on four content areas, including cognitive, behavioral, interpersonal, and case management. Furthermore, this approach to treatment also strongly emphasizes the clinician's processes, such as countertransference and self-care as a crucial aspect of the treatment protocol. Seeking Safety has been used in a variety of settings, including inpatient, outpatient, and residential, and is typically delivered in 90-120 minute group sessions.

SIT has also been determined to have modest empirical support in its efficacy of treating PTSD (Hajcak & Starr, n.d.). The SIT approach to PTSD treatment focuses exclusively on an anxiety-reduction approach (Veronen & Kilpatrick, 1983). More specifically, this treatment focuses on teaching concrete coping skills to tolerate the distress related to PTSD symptoms. Examples of coping skills often taught in this approach include deep muscle relaxation, cognitive restructuring, breathing exercises,

thought stopping, and assertiveness skills training. SIT is often implemented in

conjunction with other supplementary psychotherapies or as a precursor to exposure-

based treatments.

    While EMDR has strong empirical support, it has also been considered

controversial (Hajcak & Starr, n.d.). Developed by Shapiro (2001), this exposure-based

treatment to PTSD is unique in that it incorporates bilateral stimulation, through

mechanisms such as rapid eye-movement, finger tapping, or vibration. The incorporation

of bilateral stimulation is founded on the theory that, during trauma, there is insufficient

processing of the many elements (i.e., sensory, cognitive, affective) of the trauma.

Current controversies on the efficacy of EMDR will be discussed at length in later

chapters of this dissertation.

    The final treatment approach reviewed by Hajcak and Starr (n.d.) was

psychological debriefing. Upon their review, it was determined that this approach to

treatment had no research support in terms of efficacy and was potentially harmful.

Psychological debriefing has historically been one of the most widely used methods of

trauma intervention (McNally, Bryant, & Ehlers, 2003) and consists of techniques such

as crisis intervention, group debriefing, critical incident stress debriefing, and process

debriefing (van Emmerik, Kamphuis, Hulsbosch, & Emmelkamp, 2002).

Statement of Problem and Purpose

    To date, there have been numerous studies on the efficacy of psychological

treatments for PTSD; however, as discussed in more detail in the following chapter, most

of these studies tend to focus on the efficacy of one PTSD-specific treatment compared to

a treatment-as-usual group. As such, the current state of knowledge on PTSD treatments

has not yet fully examined the state of empirically supported treatments' (ESTs) efficacy

in relation to other PTSD treatments, evidenced by the lack of meta-analyses on the

efficacy of PTSD treatments.

The purpose of this dissertation is to expand on the current body of knowledge on

PTSD treatments by conducting a meta-analysis on ESTs of PTSD as defined by the

Society of Clinical Psychology (Hajcak & Starr, n.d.), which includes (a) PE (Foa et al.,

2007); (b) CPT (Resick & Schnicke, 1996) ; (c) SIT (Veronen & Kilpatrick, 1983) ; (d)

EMDR (Shapiro, 2001); and (e) PCT (Classen et al., 2001). Additionally, Seeking Safety

(with co-morbid substance use disorder; Najavits, 2002b; Najavits, 2009) will also be

excluded from the present study because of its unique group-only format and its focus on

dually diagnosed individuals. For the purposes of this dissertation, other treatments for

PTSD, including but not limited to Acceptance and Commitment Therapy (Wasler &

Hayes, 1998), Dialectical Behavior Therapy (DBT; Harned, Jackson, Comtois, &

Linehan, 2010), Psychological Debriefing (McNally et al., 2003), and other Cognitive

Behavioral Therapies (CBT; Follette, Ruzek, & Abueg, 1998) will not be included in the

analysis due to lack of sufficient empirical research studies on the efficacy of their use

specific to PTSD, or as is the case with Psychological Debriefing, having a potentially

harmful effect.

Research Questions

In line with the problem and purpose, this project aims to answer the following research questions:

RQ1: Of all the PTSD treatments endorsed by the Society of Clinical Psychology, which appear to have the strongest effect in reducing PTSD symptomatology?

RQ2: How does treatment efficacy differ as a function of individual factors or characteristics (i.e., gender, type of trauma, co-morbid diagnosis)?

RQ3: How do treatment factors (i.e., setting, number of sessions, dropout rates, modality) impact treatment efficacy?

Delimitations

The study had the following delimitations:

1. Because the main focus of this study is on the efficacy of PTSD treatment on individual functioning and symptom reduction (i.e., within subjects effects), studies that are exclusively cross-sectional (i.e., between subjects effects) in nature will not be included in the review.

2. This study will only examine empirically, peer-reviewed articles, and as such, other types of scholarly work (i.e., theses, dissertations) will be excluded from this review.

3. Due to the lack of conclusive clinical efficacy and the potentially harmful effect of psychological debriefing, it will not be included in this meta-analysis (Hajcak & Starr, n.d.).

4. Due to the unique nature of Seeking Safety (i.e., group-only format, indicated for co-morbid substance use disorders), it will not be included in this analysis.

Importance of the Study

This proposed study will help build on the empirical knowledge of the treatment of PTSD in that it will provide evidence for the efficacy of specific treatments in relation to other supported treatments. This study aims to examine what, if any, factors might confound or moderate treatment efficacy. Implications from this study may impact treatment planning, clinical interventions, as well as clinical training. Results from this study may be applicable to healthcare organizations in terms of reducing the financial burden of PTSD by identifying the most clinically- and cost-effective approaches to treatment and by reducing secondary health costs associated with chronic and persistent PTSD.

CHAPTER II

REVIEW OF LITERATURE

Evidenced Based Psychotherapy

Over the past few decades, there has been increased attention given to evidence-based practice within the field of psychology (Goodheart et al., 2006).   Within this shift, there has been increased attention on the ability of process and outcome research to provide evidence to support the efficacy of psychological treatments, including psychotherapy.   There have been a variety of terms used to describe evidence for psychological treatment such as evidence-based practice (Goodheart et al., 2006) and ESTs (Chambless & Hollon, 1998). While sometimes used interchangeably, these two terms tend to describe slightly different concepts. Evidence-based practice is viewed as an umbrella term to describe psychological practices that are founded in theoretical and empirical support (Goodhart et al., 2006).   Empirically supported treatment, in contrast, is used to describe a specific treatment, typically manualized, for a particular disorder (Chambless & Hollon, 1998) that has received support using randomized control trials. For the purposes of this literature review, the focus will be on ESTs for PTSD.

Posttraumatic Stress Disorder

PTSD is a psychological disorder that occurs following exposure to a traumatic event (American Psychiatric Association, 2013). From this perspective, a traumatic event is characterized as "exposure to actual or threatened death, serious injury, or sexual

violence" (American Psychiatric Association, 2013, p. 271). Following exposure to a

trauma, individuals with PTSD experience distress including intrusive symptoms (e.g.,

flashbacks); avoidance of internal and external triggers of the traumatic event; negative

cognitions; and changes in arousal that have a significant impact on social, occupational,

or other areas of functioning. These symptoms must be present for a period greater than

one month. Additionally, PTSD can be present with dissociative symptoms, which may

manifest as depersonalization or derealization. PTSD can also have delayed expression

in which symptoms do not become present until six months or more following the

traumatic event (American Psychiatric Association, 2013).

Treatment for PTSD

Many approaches to the treatment for PTSD have been developed and utilized,

spanning across numerous theoretical approaches, including but not limited, to cognitive-

behavioral, psychodynamic, hypnosis, and pharmacological interventions (Foa, Keane, &

Friedman, 2004). Hajcak and Starr (n.d.) have evaluated the following treatments: PE

(Foa et al., 2007), PCT (Classen et al., 2001), CPT (Resick & Schnicke, 1996), Seeking

Safety (Najavits, 2002a), SIT (Veronen & Kilpatrick, 1983), EMDR (Shapiro, 1995), and

Psychological Debriefing (Bisson, McFarlane, Rose, Ruzck, & Watson, 2004). Each of

these treatments is described in more depth below and includes an overview of the

treatment, theoretical foundations, treatment approach, and a summary of the empirical

support.

Prolonged Exposure

PE is an approach to PTSD treatment, created by Foa and her colleagues, focusing primarily on the emotional processing of traumatic experiences (Foa et al., 2007). PE is considered to be a brief (approximately 10-16 sessions) approach to PTSD treatment. A key feature that differentiates PE from other cognitive-behavioral approaches to treatment is its strong focus on exposure. In PE, exposure is achieved through both imaginary and *in vivo* experiences. This treatment approach is designed to be an individual approach and consists of 90-minute sessions, which also differentiates this treatment from traditional 60-minute sessions.

Theoretical Context for Prolonged Exposure

The theoretical underpinnings of PE are rooted in Emotional Processing Theory (Foa & Kozak, 1986), which is a framework for understanding and explaining anxiety responses associated with traumatic experiences and the mechanisms through which exposure is believed to reduce these symptoms. The main premise within this theory is the idea that fear serves the function of escaping danger. Building on this, a feared stimuli (e.g., a bear) results in a fear response (e.g., increased heart rate, release of adrenaline, sweating). Following the event, meaning becomes attributed to both the stimuli ("bears are dangerous") and the physiological response ("feeling like this must mean I am afraid"; Foa et al., 2007). Within the framework of Emotional Processing Theory, this process is referred to as a fear structure.

In many cases, fear structures are adaptive and serve the purpose of self-protection from danger (Foa et al., 2007). Being exposed to a bear has the realistic

potential for danger and the fear response makes it functional and protective. On the
other hand, there are times in which fear structures are maladaptive. Fear structures are
considered to be pathological when associations between stimulus elements are not
accurate; physiological and avoidance responses are elicited by harmless stimuli;
excessive and easily triggered responses interfere with daily functioning; or harmless
stimuli are associated with threat meaning.

Experiencing a traumatic, life-threatening event leads many individuals to
develop pathological fear structures (Foa et al., 2007). This theory further postulates that
the symptoms of PTSD are often expressions of pathological fear structures in which a
large number of stimuli, including both thoughts and external cues, are erroneously
associated with the meaning of danger. This erroneous pairing between once neutral
stimuli and the trauma also accounts for the symptoms of hypervigilance, which this
theory explains as being the physiological response resulting from the erroneous pairing
between the non-threating stimuli and a fear/danger meaning.

Emotional Processing Theory builds on this notion of a fear structure to state that
there are two conditions necessary to become healthy and adaptive. The first is that the
fear structure must become activated. In other words, a fear structure cannot be modified
if it is not activated in the moment for the corrective experience. The second condition
needed is new information that is incompatible with the erroneous information associated
with the pathological fear structure. In PE, the correction of a pathological fear structure
is achieved through exposing the client to feared stimuli (e.g., thoughts or triggers of the

trauma) in order to activate the fear response in a safe and controlled environment (Foa et al., 2007).

Treatment Approach of Prolonged Exposure

The PE protocol consist of 10 or more individual session of 90 minutes each (Foa et al., 2007). The purpose of the first session is to present the client with an overview of the treatment process. Within this discussion, a few key points are highlighted. First, general information about PTSD is given, which may or may not include a formal PTSD evaluation and diagnostic interview. Secondly, clients are given information about the PE approach to treatment, including the use of imaginary and *in vivo* exposures, and clients are made aware that this treatment may increase distress before symptoms begin to reduce. Following this discussion, clients are offered an opportunity to provide their informed consent about moving forward with treatment. Session one also includes an introduction to breathing retraining and clients are encouraged to begin practicing these new breathing techniques on a daily basis.

The second session encourages clients to explore their personal reactions to the trauma and the impact that it has had on them (Foa et al., 2007). Clients are also provided with psychoeducation about the impact of trauma with the goal of normalizing and validating clients' current experiences. Next, clients are provided with information about the rationale behind exposure. Lastly, in this session, therapists and clients create a hierarchy of situations, activities, or places that clients have been avoiding. This hierarchy will later become the foundation of *in vivo* exposure homework, which begin after this session. As an example, a client who has a strong avoidance urge related to

going to the supermarket during the day would be encouraged to challenge this urge by going to the supermarket during the day and keeping a log of anxiety ratings.

Session three begins with a review of the first *in vivo* exposure homework (Foa et al., 2007). Following the review of homework, clients are provided with information about the purpose and rationale of the imaginal exposures. It is also during the third session that clients are first guided through an imaginary exposure. During this exposure, clients are instructed to recount the trauma in as much detail as possible for about 45-60 minutes. The clients' recounting of the trauma is recorded and the clients are asked to listen to the recording on a daily basis as a part of their homework. The remaining 15-20 minutes of the session are spent discussing and processing the client reactions to recounting the trauma. In addition to listening to the imaginary exposure, clients are also asked to continue in vivo exposures.

The intermediate sessions (4 through approximately 9) consist of a similar process to session three (Foa et al., 2007) and start with a review of the homework, in session imaginal exposure, processing of the exposure, and assigning of homework. Over the course of treatment, clients will typically be able to remember the trauma in more detail and the imaginary exposures will begin to focus on the most distressing aspects of the trauma. Additionally, as the clients begin to improve, the imaginal exposure often become shortened to approximately 30 minutes. Homework during this stage of treatment continues to have the clients listen to imaginal exposure on a daily basis and to continue *in vivo* exposures.

The final session of PE will start in a typical fashion with review of the homework assignments (Foa et al., 2007). Next, clients are encouraged to explore their growth over the course of treatment. Clients are also encouraged to continue to practice the *in vivo* exposures as a part of continued maintenance following termination of formal treatment. Lastly, any additional referrals are made as needed for continued care.

Empirical Support for Prolonged Exposure

A summary of the empirical studies found on PE are outlined in Table 1. As shown, the literature search found 12 studies testing the efficacy of PE that met inclusion criteria for this meta-analysis (Aderka, Gillihan, McLean, & Foa, 2013; de Bont et al., 2013; Foa et al., 1999; Foa et al., 2005; Foa, Rothbaum, Riggs, & Murdock, 1991; Feeny, Zoellner, Mavissakalian, & Roy-Byrne, 2009; Hagenaars, van Minnen, & de Rooij, 2010; Minnen, Wessel, Dijkstra, & Roelofs, 2002; Resick, Nishith, Weaver, Astin, & Feuer, 2002; Rothbaum, Astin, & Marsteller, 2005; Yoder et al., 2012). Across these studies, PE was compared to a variety of alternative treatments such as SIT (Foa et al., 1991), combined PE-SIT (Foa et al., 1999), PE with cognitive restructuring (Aderka et al., 2013), EMDR (de Bont et al., 2013), and various waitlist and treatment-as-usual control conditions. Overall, these studies found that PE was an effective treatment in reducing PTSD symptoms and that PE had superior outcomes to SIT (Foa et al., 1999), but had comparable outcomes to EMDR (de Bont et al., 2013). Furthermore, Aderka et al. (2013) found that when PE was combined with cognitive restructuring, outcomes were superior for treating co-occurring PTSD and depression.

Table 1

Summary of Empirical Studies on Prolonged Exposure (PE)

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Study	Sample	Comparison	Outcomes	Treatment Length	Assessment Phases	Results
Foa et al. (1991)	N = 45 n = 45 (female) n = 0 (male)	SIT SC WL	RAST STAI BDI MBCS	9, 90-min sessions (biweekly)	Pre-Tx Post-Tx 3 mo F/U	All groups saw a decrease of symptoms at post-treatment PE had superior symptom reduction at follow up
Foa et al. (1999)	N = 96 n = 96 (female) n = 0 (male)	SIT (Modified) PE-SIT WL	SCID PSS-I SAS BDI STAI	2, 120-min sessions (weekly) followed by 7, 60-min sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U 6 mo F/U 12 mo F/U	All active treatments reduced PTSD and depression severity at post-treatment PE had greater reduction of PTSD symptoms and global adjustment at follow up and had greater overall effect sizes
Resick et al. (2002)	N =171 n = 171 (female) n = 0 (male)	CPT MA	CAPS SCID PSS BDI TRGI	12, 90-min sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U 9 mo F/U	Both active treatments (e.g., PE and CPT) were efficacious and superior to MA

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Table 1 (contuined)

Study	Sample	Comparison	Outcomes	Treatment Length	Assessment Phases	Results
Foa et al. (2005)	N = 121 n = 121 (female) n = 0 (male)	PE/CR WL	SCID PSS-I BDI SAS PSS-SR	Up to 12, 90-min sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U 6 mo F/U 12 mo F/U	PE and PE/CR significantly reduced PTSD and depression compared to WL CR did not appear to enhance treatment outcomes
Aderka et al. (2013)	N = 153 n = 153 (female) n = 0 (male)	PE/CR	SCID-I PSS-I BDI	9-12, 90-min sessions (weekly)	Pre-Tx Bi-weekly during treatment Post-Tx	PE accounted for a greater reduction in PTSD symptoms compared to PE/CR Both PE and PE/CR had a secondary reduction of depression through PTSD symptom reduction
Feeny et al. (2009).	N = 74 n = 74 (female) n = 0 (male)	SER	PDS BDI STAI PSS-I SCID	10, 60-90 min sessions (weekly; PE group) 10, 30 min sessions (weekly; SER group)	Pre-Tx Post-Tx	PE had superior outcomes to SER with moderate to large effect sizes at post-treatment

(continued)

Table 1 Contuined

Study	Sample	Comparison	Outcomes	Treatment Length	Assessment Phases	Results
Aderka et al. (2013)	N = 153 n = 153 (female) n = 0 (male)	PE/CR	SCID-I PSS-I BDI	9-12, 90-min sessions (weekly)	Pre-Tx Bi-weekly during treatment Post-Tx	PE accounted for a greater reduction in PTSD symptoms compared to PE/CR Both PE and PE/CR had a secondary reduction of depression through PTSD symptom reduction
Feeny et al. (2009).	N = 74 n = 74 (female) n = 0 (male)	SER	PDS BDI STAI PSS-I SCID	10, 60-90 min sessions (weekly; PE group) 10, 30 min sessions (weekly; SER group)	Pre-Tx Post-Tx	PE had superior outcomes to SER with moderate to large effect sizes at post-treatment
de Bont et al. (2013)	N = 240	EMDR WL + TAU	CAPS PSS-SR T-AEQ GPTS AHRS AVH-BAS BDI-II	8, 90 min sessions (weekly)	Pre-Tx Mid-Tx Post-Tx 6 mo F/U 12 mo F/U	Both PE and EMDR demonstrated strong empirical support in PTSD symptom reduction at post-treatment and follow ups Mid-Treatment assessments indicate potential mechanisms of change for both PE and EMDR groups

(continued)

Table 1 (Contuined)

Study	Sample	Comparison	Outcomes	Treatment Length	Assessment Phases	Results
Hagenaars et al. (2010)	N = 99 n = 80 (female) n = 19 (male)	N/A	CAPS PSS-SR PTCI SCID-I SCID-II	8-12, 45 min sessions (weekly)	Pre-Tx Post-Tx 6 mo F/U	PE resulted in reduction in negative trauma-related cognitions Reduction in trauma-related cognitions was associated with reduced PTSD symptoms Reduction in both re-experiencing and trauma-related cognitions was preceded by reduction in trauma-related distress
Rauch et al. (2009)	N = 10 n = 2 (female) n = 8 (male)	N/A	PDS BDI-II PTCI DES STAI CAPS MINI	7-21, 80 min sessions (weekly)	Pre-Tx Post-Tx	Participants saw a significant reduction in PTSD and depression symptoms
Rothbaum et al. (2005).	N = 74 n = 74 (female) n = 0 (male)	EMDR WL + TAU	CAPS AII SLESW SCID PSS-SR IES-R BDI DES-II STAI	9, 90 min sessions (biweekly)	Pre-Tx Post-Tx 6 mo F/U	Both PE and EMDR demonstrated significant reduction of PTSD symptomatology PE and EMDR did not differ significantly in the amount of change from pre- to post-treatment or at follow up

(continued)

Table 1 (contuined)

Study	Sample	Comparison	Outcomes	Treatment Length	Assessment Phases	Results
Rothbaum et al. (2005).	N = 74 n = 74 (female) n = 0 (male)	EMDR WL + TAU	CAPS AII SLESW SCID PSS-SR IES-R BDI DES-II STAI	9, 90 min sessions (biweekly)	Pre-Tx Post-Tx 6 mo F/U	Both PE and EMDR demonstrated significant reduction of PTSD symptomatology PE and EMDR did not differ significantly in the amount of change from pre- to post-treatment or at follow up
Yoder et al. (2012)	N = 112 n = 9 (female) n = 103 (male)	War time era (i.e., Vietnam, Gulf War, OIF/OEF/ OND)	PCL-M BDI-II	90 min sessions (weekly)	Pre-Tx Post-Tx	All participants showed significant reduction in PTSD symptoms

Table 1 (contuined)

Study	Sample	Comparison	Outcomes	Treatment Length	Assessment Phases	Results
Minnen et al. (2002)	N = 20 n = 13 (female) n = 7 (male)	N/A	PSS-SR STAI	Not indicated	Pre-Tx Post-Tx	Less than half the sample improved (n = 8) on PTSD symptoms

All patients had significant decreases in disorganized thoughts |

Note. Tx = Treatment; PE = Prolonged Exposure; SIT = Stress Inoculation Training; SC = Supportive Counseling; WL = Waitlist Control; RAST = Rape Aftermath Symptom Test; STAI = Strait Anxiety Inventory; BDI = Beck Depression Inventory; MBCS = Motivation for Behavior Change Scale; F/U = Follow Up; PE-SIT = Combined Prolonged Exposure Stress Inoculation Training; SCID = Structured Clinical Interview for *DSM*; PSS-I = Posttraumatic Stress Scale; SAS = Social Adjustment Scale; CPT = Cognitive Processing Therapy; MA = Minimal Attention; CAPS = Clinician Administered PTSD Scale; TRGI = Trauma Related Guilt Inventory; PE/CR = Prolonged Exposure plus Cognitive Restructuring; SER = Setraline; EMDR = Eye Movement Desensitization and Reprocessing; TAU = Treatment As Usual; AE = Adverse Events; T-AEQ = Adverse Events Questionnaire; AHRS = Auditory Hallucination Rating Scale; PTCI = Posttrauma Cognitions Inventory; GPTS = Green Paranoia Thought Scale; STAI = Strait-Trait Anxiety Inventory.

Treatment Limitations, Critiques, and Further Considerations for Prolonged Exposure

Prolonged Exposure consists of extensive use of exposure both inside and outside of therapy (Foa et al., 1991). The purpose of these exposures, as described above, is to habituate to the distressing reaction to triggers of the trauma. However, exposure is often unpleasant and can be very distressing to clients, especially early on in treatment. It is not uncommon that individuals may actually experience an increase or flooding of PTSD symptoms at the start of treatment. As a result of these potential increases of symptoms, it is not recommended that PE be conducted on individuals who are actively abusing substances (Foa et al., 1991). Additionally, individuals in early recovery from substance abuse may be at heightened risk of relapse during the initial stages of PE (Foa et al., 1991).

Also related to the increased distress in early treatment, Feeny et al. (2009) have found that some individuals may choose alternative treatments for PTSD besides PE due to the high distress often experienced during the course of treatment. Imel, Laska, Jakupcak, & Simpson (2013) have also found that the initial increase in distress sometimes experienced when starting PE may be associated with increased likelihoods of client dropout rates. Foa et al. (1991) acknowledged the potential for increased symptoms; however, they do caution clinicians and clients from using the potential increased symptoms as reason to not undergo treatment, noting that putting off treatment may serve to reinforce the avoidance symptoms of PTSD. Foa and her colleagues further

go on to say that comprehensive informed consent, including discussion of both the risks and benefits of PE, is likely to increase treatment adherence.

Cognitive Processing Therapy

CPT was first introduced in the late 1990s by Resick and Schnicke (1996) as a comprehensive treatment for women who had experienced a rape. Since its first introduction, CPT has been expanded beyond female victims of rape to include a variety of populations, such as childhood physical abuse (Iverson et al., 2011), childhood sexual abuse (Resick et al., 2002), and combat-related traumas (Macdonald, Monson, Doron-Lamarca, Resick, & Palfai, 2011; Resick, Monson, & Chard, 2006). CPT is a manualized approach to treating PTSD with roots in cognitive-behavioral therapy (CBT). While originally designed as an approach for individual therapy, CPT has also been adapted for group modalities (Resick et al., 2006).

Theoretical Context for Cognitive Processing Therapy

As mentioned, CPT does have roots in CBT; however, the theoretical underpinnings of this approach are most strongly based in Information Processing Theory (Resick & Schnicke, 1996). Essentially, Information Processing Theory relates to the processes in which information is encoded and the way in which memories are recalled. Within this paradigm, it is believed that large amounts of information are organized and processed through schemata, which can be viewed as organized sets of information that interact with incoming information to aid understanding, interpreting, and consolidating the influx of new information. While schemas are helpful in processing large amounts of information relatively quickly, new information that does not fit within current schemata

cannot be fully integrated. In such instances, the new information that is inconsistent with current schemata must be either assimilated or accommodated in order for the information to be fully processed. Assimilation refers to the process that occurs in which information is altered or sometimes distorted in order to fit within the context of an existing schema (Inhelder & Piaget, 1958). Accommodation, on the other hand, refers to the process in which schemata are changed or new schemata are created to reconcile the newly received information.

For many individuals, experiencing a trauma does not consolidate well within current schemata (Resick & Schnicke, 1996). A common schema that individuals hold is the just-world belief, which generally refers to the notion that good things happen to good people and bad things happen to bad people (Lerner & Miller, 1978). While many individuals hold this belief, likely as a defense mechanism, the just-world belief is not true. One of the clearest examples that the just-world belief is untrue occurs when individuals experience trauma, in which a bad event happens to a good person. As such, many individuals who have experienced a trauma will assimilate that experience into their existing just-world belief, which often manifests in terms of self-blame (i.e., "if this bad thing happened to me, I must have done something to deserve it"). Additionally, following a traumatic event, some individuals may overaccommodate this experience into new and problematic schemata (i.e., "the world is not a safe place"; "I cannot trust anyone"). Additionally, individuals who have experienced traumatic events often struggle with processing information related to existing schemata of safety, trust, power, esteem, and intimacy (Resick & Schnicke, 1996).

Building on these two processes, this theory postulates that when information is not accurately processed, individuals often experience intrusive recollections, flashbacks, nightmares, and other symptoms of PTSD (Resick & Schnicke, 1996). These intrusive symptoms are typically experienced with strong and unpleasant affective responses, and as such, individuals will often engage in escape or avoidance behaviors. Therefore, this approach to treatment aims to help clients achieve a healthy and realistic outlook on the world by supporting them through the process of fully processing the emotions associated with the event and successful accommodation of the events. Put another way, the goal of CPT is to help clients to refrain from assimilating the events of the trauma, and to support healthy and adaptive accommodation without overaccommodation, which occurs when individuals make overgeneralizations or rules about singular experiences. More specifically, CPT aims to reach these goals by helping individuals who have experienced a trauma to understand how thoughts and emotions are interconnected, to accept that the traumatic event actually occurred and that it cannot be ignored or discarded, to experience the range of emotions associated with the trauma fully, to analyze and confront maladaptive beliefs, and to explore how prior experiences and beliefs have impacted reactions to the trauma and how the trauma has impacted those beliefs.

Treatment Approach for Cognitive Processing Therapy

CPT is considered a brief approach to treatment of PTSD that is typically comprised of approximately 12 sessions of 60 minutes (Resick & Schnicke, 1996). As a general approach to treatment, CPT includes a variety of specific interventions including but not limited to, psychoeducation, cognitive and behavioral strategies, and exposure. A

key feature that differentiates CPT from other trauma-specific forms of CBT is CPT's increased focus on stuck points, which refers to conflicts between beliefs and the experience of trauma. In other words, stuck points occur when trauma victims either assimilate or overaccommodate the trauma experience.

While there are specific guidelines proposed for each session, in general, each CPT session will start with a review of the practice assignment, session-specific content, with the last 15 minutes of each session is reserved for introducing the next practice assignment (Resick et al., 2006). Within the context of this approach to treatment, therapists are encouraged, using their clinical judgment, to remain structured in the approach to treatment, as this serves to challenge some avoidance behaviors associated with PTSD. In the event that practice assignments are not completed, however, therapists are advised to troubleshoot barriers to completing the assignment, with the assignment then completed in session with clients. The purpose of ensuring assignment completion is to challenge avoidance. A session-by-session overview of the CPT approach to treatment is reviewed below.

The first session consists of an introduction to treatment and education about trauma and PTSD (Resick & Schnicke, 1996). Specifically, clients are provided with information about trauma and its association with symptoms of PTSD and depression. The purpose of this introduction is twofold. First, by outlining the treatment protocol, clients are empowered with the ability to make informed consent about continuing treatment. Secondly, the first session aims to create a therapeutic alliance to help increase treatment compliance. Within the context of CPT, compliance is viewed as both

attendance and completion of practice assignments. As is common with most therapies,

the first session serves to begin the rapport-building so that clients feel understood and

heard. After these two topics are covered, clients are provided with information about

stuck points, which are conflicting beliefs or strong negative beliefs that often result in

strong and uncomfortable emotion.   Lastly, clients leave session one with instructions to

write a minimum of one page on what it means that they have experienced a trauma.

The second session begins with reviewing the practice assignment from the prior

session, and the majority of session two is spent exploring the meaning of the trauma

(Resick & Schnicke, 1996). The purpose of this exploration is for therapists and clients

to start to be able to identify stuck points. In this session, clients are also introduced to

the A-B-C (activating event, belief, consequence) model, and provided with multiple

copies of A-B-C worksheets to start tracking their thoughts, feelings, and actions in

between sessions. For the purposes of CPT, the A-B-C model encourages clients to

describe the event (what happened), their beliefs about the event ("I tell myself

something"), and the consequences ("I feel and do something").

The third session builds on prior sessions by reviewing the client A-B-C

worksheets, and the goal of this session is to support clients in identifying thoughts and

feelings (Resick & Schnicke, 1996). In support of this goal, therapists and clients will

often review the A-B-C worksheets, and therapists will help clients to begin

differentiating between thoughts and feelings. In early stages of treatment, it is not

uncommon for clients to mislabel thoughts as feelings (e.g., "I feel like this shouldn't

have happened"), and clients are encouraged to use the phrase "I think" for thoughts and

"I feel" for emotions.   Homework for the third session includes writing out a full account of the trauma with as much sensory detail as possible. For individuals who have experienced multiple traumas, clients are asked to write about the trauma that seems most salient or difficult to resolve.

The main focus of session four is remembering the trauma event (Resick & Schnicke, 1996).   This session starts with clients reading their account of the trauma, and therapists and clients continue to identify stuck points. In session, these stuck points are often anxiety-provoking and clients are encouraged to stick with the strong affect as opposed to giving in to the urge to avoid the distress. Following this session, clients are tasked with rewriting their trauma experience, and this time, they are encouraged to write their current thoughts and feelings as they occur when writing the account.

Session five focuses on the identification of stuck points (Resick & Schnicke, 1996). Stuck points rooted in assimilation are often characterized by "if only" statements (e.g., "if only I hadn't been alone, I wouldn't have been raped"). Assimilated stuck points are often expressed as self-blame. Overaccommodation-related stuck points, on the other hand, tend to be expressed as overgeneralizations about safety (e.g., "I can never go out at night again"). As stuck points are identified, clients are provided with worksheets related to challenging these beliefs and are tasked with completing these worksheets in the time between sessions.

Session six continues to build on challenging stuck points (Resick & Schnicke, 1996). In session, therapists and clients review the challenging thoughts worksheets completed the week prior, and therapists support clients in continuing to challenge and

confront maladaptive or inaccurate beliefs. Building on challenging questions already presented, in this session, clients are introduced to the concept of examining the evidence for a particular belief. Clients are provided with additional challenging beliefs worksheets that incorporate these additional questions and they are asked to complete these before the next session.

Session seven is devoted to examining faulty thinking patterns (Resick & Schnicke, 1996). In session, clients are provided with information and descriptions of common faulty thinking patterns, including drawing conclusions that are not substantiated by evidence, exaggerating or minimizing, disregarding important aspects of the situation, oversimplifying (i.e., black/white thinking), overgeneralizing, mind reading, and emotional reasoning. Clients are then presented with the challenging beliefs worksheet and are asked to continue to work on challenging beliefs and identifying faulty thinking patterns between sessions.

Sessions eight through eleven continue to explore and challenge stuck points; however, these sessions are content-specific to general themes that are often the source of stuck points for many trauma clients (Resick & Schnicke, 1996). In each of these sessions, clients are presented with psychoeducation related to the theme and clients continue to identify and challenge stuck points both inside and outside of the therapy hour. These key themes include safety (session eight), trust (session 9), power and control (session 10), and esteem issues (session 11).

The final session of a CPT protocol introduces one final theme, intimacy and meaning making (Resick & Schnicke, 1996). This first part of this session follows the typical format from session eight through 11. The remainder of the session focuses on a review of all concepts covered throughout the course of therapy. Additionally, client's growth and progress over the course of treatment is highlighted and the clients are encouraged to reflect and process this growth. Future goals and aspirations are discussed. Lastly, when applicable and appropriate, referrals or recommendations for further treatment are made.

Empirical Support for Cognitive Processing Therapy

As shown in Table 2, there were 14 articles identified that meet the inclusion criteria for the present meta-analysis. The studies reviewed found that CPT was associated with significant reductions in PTSD symptoms (Alvarez et al., 2011; Basharpoor, Narimani, Gamari-Give, Abolgasemi, & Molavi, 2011; Chard, 2005; Chard, Schumm, Owens, & Cottingham, 2010; Galovski, Blain, Mott, Elwood, & Houle, 2012; Iverson et al., 2011; Jeffreys et al., 2014; Liverant, Suvak, Pineles, & Resick, 2012; MacDonald et al., 2011; Monson et al., 2006; Nishith, Resick, & Griffin, 2002; Resick & Schnicke, 1992; Resick et al., 2002). In the studies reviewed, CPT has been compared to PE (Nishith et al., 2002; Jeffreys et al., 2014), waitlist conditions (MacDonald et al., 2011), treatment as usual (Alvarez et al., 2011), and variants of the CPT protocol (Iverson et al., 2011).

Table 2

Summary of Empirical Studies on Cognitive Processing Therapy (CPT)

Study	Sample Size	Comparison	Outcomes	Tx Length	Assessment Phases	Results
Nishith et al. (2002)	N = 171 n = 171 (female) n = 0 (male)	PE MA	CAPS PSS	9, 90 min sessions (biweekly)	Pre-Tx Post-Tx	Both CPT and PE groups experienced significant reduction in PTSD symptoms, specifically with relation to re-experiencing and arousal
Macdonald et al. (2011)	N = 60 n = 6 (female) n = 54 (male)	WL	CAPS PCL	12, 60 min sessions (weekly)	Pre-Tx During Tx Post-Tx 1 mo F/U	CPT was associated with a rapid and significant reduction in PTSD symptoms with a medium effect size

(continued)

Table 2 (Continued)

Study	Sample Size	Comparison	Outcomes	Tx Length	Assessment Phases	Results
Liverant et al. (2012)	N = 126 n = 126 (female) n = 0 (male)	CPT-C WA	CAPS SCID BDI-II PDS	12, 60 min sessions (biweekly; CPT and CPT-C) 2, 60 min sessions followed by 5, 120 min sessions (weekly; WA)	Pre-Tx During Tx Post-Tx 6 mo F/U	CPT and CPT-C were associated with decreases in both PTSD and depression symptoms
Iverson et al. (2011)	N = 150 n = 150 (female) n = 0 (male)	CPT-C WA	STI CTS BDI-II PDS	12, 60 min sessions (biweekly; CPT and CPT-C) 2, 60 min sessions followed by 5, 120 min sessions (weekly; WA)	Pre-Treatment During Treatment (weekly) Post-Treatment 6 mo follow up	CPT associated with reduced PTSD symptoms

(continued)

Table 2 (Continued)

Study	Sample Size	Comparison	Outcomes	Tx Length	Assessment Phases	Results
Jeffreys et al. (2013)	N = 263 n = 6 (female) n = 257 (male)	PE	PCL CAPS	12, 60 min sessions (weekly; CPT) 10-15, 90 min sessions (weekly; PE)	Pre-Treatment Post-Treatment	PE was significantly more effective at reducing PTSD symptoms compared to CPT
Galovski et al. (2012)	N = 100 (note. Gender breakdowns not reproted)	MCPT SMDT	CAPS SCID PDS BDI-II TRGI QOLI SF-36	12, 60 min sessions (weekly; CPT) 4-18, 60 min sessions (weekly; MCPT)	Pre-Treatment Post-Treatment 3 mo follow up	CPT was associated with reduction of both primary (i.e., PTSD and depression) symptoms and secondary (i.e., guilt, QOL, mental health, social function) symptoms

Table 2 (Continued)

Study	Sample Size	Comparison	Outcomes	Tx Length	Assessment Phases	Results
Resick et al. (2002)	N = 150 n = 150 (female) n = 0 (male)	CPT-C WA	CAPS SCID BDI-II PDS TRGI	12, 60 min sessions (biweekly; CPT and CPT-C) 2, 60 min sessions followed by 5, 120 min sessions (weekly; WA)	Pre-Tx During Tx (weekly) Post-Tx 6 mo F/U	Across all groups, participants had significant reductions of primary (i.e., PTSD, depression) symptoms Compared to the WA group, those in the CPT-C group had greater improvements of PTSD symptom reduction
Resick et al. (1992)	N = 38 n = 38 (female) n = 0 (male)	WL	SCL-90-R BDI SCID	12, 90 min group sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U 6 mo F/U	CPT group had significnat decreases in PTSD symptoms from pre- to post-treatment

Table 2 (Continued)

Study	Sample Size	Comparison	Outcomes	Tx Length	Assessment Phases	Results
Monson et al. (2006)	N = 60 n = 6 (female) n = 54 (male)	WL	CAPS PCL-M	12, 60 min sessions (weekly)	Pre-Tx During Tx Post-Tx 1 mo F/U	CPT was associated with a a reduction of symptoms for 50% of participants
Alvarez et al. (2011)	N = 197 n = 0 (female) n = 197 (male)	TAU	PCL BDI SCL-6	14, 90 min group sessions (weekly; CPT) 15, 90 min group session (weekly; TAU)	Pre-Tx Post-Tx	CPT associated with greater PTSD symptom reduction than TAU

(continued)

Table 2 (Continued)

Study	Sample Size	Comparison	Outcomes	Tx Length	Assessment Phases	Results
Chard et al. (2010)	N = 101 (note. Gender breakdowns not reported)	War time era (OIF/OEF [n = 51], Vietnam [n = 50])	CAPS PCL BDI-II	12, 60 min sessions (weekly)	Pre-Tx Post-Tx	There was a significant cohort effect on treatment outcomes with those from OIF/OEF demonstrating greater symptom reduction
Basharpoor et al. (2011)	N = 60 (note. Gender breakdowns not reported)	HR Control	SCID SCL-90-R PTCI	12, 60 min sessions (weekly; CPT) 9, 45 min sessions (weekly; HR)	Pre-Tx Post-Tx	CPT and HR were equally effective in reducing PTSD symptoms

Table 2 (Continued)

Study	Sample Size	Comparison	Outcomes	Tx Length	Assessment Phases	Results
Chard (2005)	N = 71 n = 71 (female) n = 0 (male)	MA	CAPS SCID BDI-II	17, 90 min group sessions (weekly) and 9, 60 min sessions (weekly; CPT-SA) 17, 5-10 min phone call (weekly; MA)	Pre-Tx Post-Tx 3 mo F/U 12 mo F/U	CPT is associated with greater symptom reduction than MA, and these reductions appear to remain stable up to 12 mo following treatment
Resick et al. (2002)	N =171 n = 171 (female) n = 0 (male)	PE MA	CAPS SCID PSS BDI TRGI	12, 90-min sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U 9 mo F/U	Both active treatments (e.g., PE and CPT) were efficacious and superior to MA

Note. CPT = Cognitive Processing Therapy; SIT = Stress Inoculation Training; Tx = Treatment; F/U = Follow Up; CAPS = Clinician Administered PTSD Scale; BDI = Beck Depression Inventory; PSS = Posttraumatic Stress Scale; SCID = Structured Clinical Interview for *DSM*; TRGI = Trauma Related Guilt Inventory; MA = Minimal Attention; PE = Prolonged Exposure; PCL = PTSD Checklist; PDS = Posttraumatic Diagnostic Scale; WA = Waitlist Attention; CPT-C = Cognitive Processing Therapy Cognitive Focus; QOLI = Quality of Life Inventory; SCL-90 = Symptom Checklist 90

Treatment Limitations, Critiques, and Further Considerations for Cognitive Processing Therapy

As discussed previously, CPT has been adapted for use in both individual and group modalities (Resick & Schnicke, 1996). Special considerations need to be made when determining the modality appropriate for specific clients. Resick and Schnicke (1996) have generally recommended that clients be empowered with the choice of treatment modality, such as individual versus group treatment and relevant therapist and client factors.

Group CPT offers members additional normalization, social support, and validation that they may not receive in individual therapy. Group CPT may offer the unique opportunity for clients to receive peer feedback, which may be more impactful and meaningful than therapist-provided feedback in some instances. In order for CPT groups to be most effective, it is recommended that treatment be conducted in a closed group format, offering the entire protocol to the group. In practice, however, it may be difficult to recruit and maintain a sufficient number of group members at a given time. As is common with group therapy, individual group members do not receive as much individual attention and there is always potential for dominant group members to pull attention away from others. Individual CPT has some advantages compared to group CPT, such as providing a more individualized approach to treatment and individual therapy may provide increased perceived safety, which may result in clients feeling more comfortable to disclose particular details about their trauma.

In addition to treatment modality, there are additional client and therapist factors to consider (Resick & Schnicke, 1996). Of note, Resick and Schnicke (1996) indicated that additional considerations for treatment should be made for clients who have experienced incest or marital rape, have active or recently-treated substance abuse, and among individuals with personality disorders. In all these cases, client factors often complicate the therapeutic process, and as such, the standard protocol will likely be modified to address additional clinical concerns. Regarding therapist factors, Resick and Schnicke (1996) noted that there should be some consideration of therapist gender (i.e., specifically as it relates to male therapists working with female victims of rape), therapists' attitude and belief system (i.e., as they may impact the therapy), and the risk of secondary traumatization and/or therapist burn out. Proper use of self-care, supervision, and reflective practices may all help to create a buffer between known therapist factors and potential harm to clients.

Present Centered Therapy

Present Centered Therapy (PCT), also called present-focused group therapy, is a group treatment approach for PTSD that was developed specifically for a population of adult female survivors of childhood sexual abuse (Classen et al., 2001). This treatment was developed and pilot tested to reduce the risk of HIV-infection among women with histories of childhood sexual abuse. In pilot testing, having a diagnosis of PTSD was not required for participation. This treatment was designed to heal trauma, not PTSD specifically. Since that time, PCT has also been adapted and applied to working with combat veterans meeting diagnostic criteria for PTSD (Shea, Wattenberg, & Dolan, n.d.).

Theoretical Context for Present Centered Therapy

The training manual and protocol for PCT does not explicitly discuss a theoretical framework or orientation that drives this particular approach to treatment (Classen et al., 2001). Rather, the authors discuss that this treatment evolved out of a philosophical debate on the approach to working with female survivors of childhood sexual abuse between Yalom and Spiegel. As discussed by Classen et al. (2001), Yalom argued that the healing from the trauma of childhood sexual abuse occurs through exploring current functioning within the context of a here-and-now group process. Furthermore, while Yalom acknowledged that there may be some benefit to exploring the abuse history, understanding and fully examining the history is not believed to be crucial to recovery. Speigel, as discussed by Classen et al. (2001), argued that an important piece of successful treatment requires some degree of activation of the trauma response, exploring the meanings attributed to trauma events, examining the impact of trauma experiences and current distress, and restructuring client understanding of the trauma event.

The underlying theoretical assumption of PCT is that the experiences of trauma, specifically that of childhood sexual abuse, are bound to impact individuals throughout the lifespan on both a conscious and unconscious level (Classen et al., 2001). Therefore, the primary goal of PCT is to have clients develop an awareness of maladaptive patterns that likely result from the trauma. In turn, by understanding these experiences and patterns, clients are then empowered to change maladaptive patterns to more adaptive ones, and thus, regain some control of the past. Another important task for clients in this approach is the process of shifting the sense of self within the context of others in the

environment. In other words, this approach to treatment works under the assumptions that individuals who have experienced trauma will often have an externalized sense of self and that shifting this identity inward is helpful in reducing the negative impact of the trauma. This shift is achieved throughout the therapeutic process by having clients explore how they interact and engage with others in the group dynamic and process.

Treatment Approach for Present Centered Therapy

Currently, PCT is offered exclusively in a group format, and the group typically meets for about 12 months (Shea et al., n.d.). During the first seven months of the treatment, the group meets once a week (30 sessions), and following that, the group will meet on a monthly basis (5 sessions). All sessions are scheduled for 90 minutes. Each session follows a structured format starting with check-in, followed by a review of the structure of the group (typically for only the first five or so sessions), setting the session agenda, and discussion of current issues. The last 10 minutes of each session are reserved for general comments, reactions, and a check-out.

PCT consists of several key elements, including psychoeducation about PTSD symptoms and a group format to decrease isolation and increase social support and connection (Shea et al., n.d.). Additionally, PCT focuses heavily on the giving and receiving of interpersonal feedback as a means to provide clients with opportunities for positive interpersonal interactions. The goals of PCT include changes in the following domains: increased self-esteem, reconnection, improving interpersonal relationships, improving coping strategies, reducing symptoms, and decreasing risk behaviors (e.g., substance use, risky sexual behaviors, revictimization; Classen et al., 2001).

The introductory stage of PCT addresses four main goals (Classen et al., 2001; Shea et al., n.d.). The first goal at this stage is to establish trust and safety in the group. Second, group members are encouraged to share with the group their current struggles and distress as a means to help facilitate group cohesiveness, normalization, and validation. Building on this, early sessions in PCT provide clients with psychoeducation about the effects of trauma to further normalize and validate members' experiences. Lastly, this stage of treatment is designed to orient clients to the group, including rules, norms, and expectations, all of which can be negotiated within the group to increase empowerment of group members. Typically, the goal of orienting clients to the group is addressed in the first session. Psychoeducation about trauma, associated disorders, and common problems associated with trauma are offered in sessions two and three. Session four addresses identification and discussion of members' problems and goals.

The next phase of treatment (approximately sessions 5 through 24) shifts the focus towards discussion of client current life issues (Shea et al., n.d.). The goals during this phase include increasing trust and fostering cohesion, continuing to develop the group atmosphere that values openness, facilitating identification of current life difficulties and their relation to the trauma, and encouraging solutions to concrete problems that arise during group. During this stage of treatment, the group facilitator's main role is to encourage and support the group process rather than attempting to solve problems for clients. In other words, the role of the facilitators is to support the group in supporting the individual's needs in the group. Specific means of creating trust in the group may include highlighting similarities of topics being raised by group members (to

support universality), encouraging and modeling direct feedback, and highlighting the connections between current struggles and the trauma.

The next major phase of treatment (sessions 25-30) focuses on highlighting progress toward goals and preparing group members for the transition to monthly sessions (Shea et al., n.d.). Specific objectives include consolidating progress, encouraging continued application of skills acquired in group, preparing members for the change in frequency of contact, and continuing to work towards self-identified goals. The rationale behind this stage is that many individual group members experience some anxiety related to fewer group sessions and the process of highlighting group closeness is intended to reduce some of this distress by encouraging group members to continue to rely on one another. Lastly, these sessions are intended to reinforce plans for coping in the time leading up to booster sessions.

The final stage of treatment (sessions 31-35) consists of monthly booster sessions (Shea et al., n.d.). These sessions continue to address the group's growth over the course of therapy, and in these sessions group members are encouraged to explore any setbacks or struggles that group members had during the increased time between meetings. The other main function of these sessions is working toward termination of the group. A key feature of the termination process in this approach to treatment is highlighting growth and reinforcing progress made over the course of therapy, while simultaneously normalizing the ebb and flow of recovery.

Empirical Support for Present Centered Therapy

As shown in Table 3, there were three studies identified testing the efficacy of

PCT (Classen et al., 2011; McDonagh et al., 2005; Ready, Gerardi, Backscheider,

Mascaro, & Rothbaum, 2010). The majority of these studies were conducted on samples

of adult women survivors of childhood sexual trauma (i.e., Classen et al., 2011;

McDonagh et al., 2005); however, one study (Ready et al., 2010) tested the use of PCT

on a sample of combat-related, male veterans. All studies found that PCT was effective

in reducing PTSD symptoms; however, PCT did not yield superior results compared to

CBT (McDonagh et al., 2005) or trauma-focused group therapy (Classen et al., 2011) and

virtual reality exposure appeared to have superior outcomes compared to PCT (Ready et

al., 2010).

**Treatment Limitations, Critiques, and Further Considerations for Present Centered
Therapy**

One of the main strengths of PCT stems from its unique focus on the group

process (Shea et al., n.d.). In the context of trauma treatment, a group approach offers

additional support through universality and cohesiveness, which supports the struggles

related to isolation and loss of community commonly reported among individuals with

PTSD. Additionally, the group approach to treatment may also provide greater

opportunity for a corrective recapitulation than individual treatment. The PCT approach

to treatment also may be of particular benefit for individuals who have experienced the

trauma long before seeking treatment, such as those with histories of childhood sexual

trauma (Classen et al., 2001) or Vietnam-era combat veterans (Shea et al., n.d.).

Table 3

Summary of Empirical Studies on Present Centered Therapy (PCT)

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Study	Sample Size	Comparison	Outcome Measures	Tx Length	Assessment Phases	Results
McDonagh et al. (2005)	N = 74 n = 74 (female) n = 0 (male)	CBT WL	CAPS SCID BDI STAXI QOLI	7, 120 min sessions followed by 7, 90 min sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U 6 mo F/U	Both CBT and PCT were associated with significant and sustained PTSD symptom reduction
Classen et al. (2011)	N = 166 n = 166 (female) n = 0 (male)	TFGT	PCL-S	24, 90 min group sessions (weekly)	Pre-Tx Post-Tx	Both PFGT and TFGT significnatly reduced PTSD symptoms greater than WL Neither treatment had an advantage in treating PTSD symptoms
Ready et al. (2010)	N = 11 n = 0 (female) n = 11 (male)	VRE	CAPS BDI SCID	10, 90 min sessions (weekly)	Pre-Tx Post-Tx 6 mo F/U	VRE had slightly more favorable outcomes at 6 mo follow up compared to PCT

Note. CBT = Cognitive Behavior Therapy; WL = Waitlist Control; CAPS = Clinician Administered PTSD Scale; SCID = Structured Clinical Interview for *DSM*; BDI = Beck Depression Inventory; STAXI = Strait-Trait Anxiety Inventory; QOLI = Quality of Life Inventory; Tx = Treatment; F/U = Follow Up

While there is evidence to support the efficacy of PCT on reducing PTSD symptoms, it is of interest that the authors of the veteran-specific protocol note that the treatment for chronic PTSD should "include systematic exposure to the individual's traumatic event for optimal benefit," which is not included within this treatment approach (Shea et al., n.d., para. 1). What this might suggest is that, while PCT is effective for reducing some symptoms of PTSD, exposure therapies might have a slight advantage over group-only approaches that do not include an exposure component.

Seeking Safety

Najavits (2002a) created Seeking Safety as a means to fill the gap in treatment often experienced by individuals with a dual-diagnosis of PTSD and a substance use disorder (SUD; American Psychiatric Association, 2013). It is not uncommon for treatment providers to refer clients with a dual-diagnosis to substance abuse treatment prior to PTSD treatment; however, for many individuals in early recovery, PTSD symptoms are exacerbated, which may in turn lead some individuals to relapse. For many individuals with this dual-diagnosis, substance abuse starts as a means of self-medicating PTSD symptoms. That being said, the goal of Seeking Safety is to address symptoms of both PTSD and substance abuse simultaneously in order to improve the prognosis of treatment for both mental health concerns. Seeking Safety has some foundations in the CBT tradition that consists of integrating four content areas (i.e., cognitive, behavioral, interpersonal, case management) into a group format consisting of 25 sessions, 90 minutes in duration.

Theoretical Context for Seeking Safety

Seeking Safety was developed based on several theoretical and observed assumptions (Najavits, 2002a, 2005). The first theoretical consideration for this treatment is that there are similarities between both SUD and PTSD, such as multiple causal and treatment relationships between the two diagnoses. The outcomes for individuals with a dual-diagnosis are often worse than for individuals with a single diagnosis, suggesting that individuals with dual-diagnosis are often in need of more intensive treatment.

This approach to treatment is also founded on the theoretical assumption that both PTSD and SUD impact one another (Najavits, 2005). As PTSD symptoms become more activated, some individuals may be more likely to have increased substance use, which, depending on the substance, may lead to increased anxiety and activation of PTSD symptoms. When both disorders are present, it becomes increasingly difficult to parcel out the root of a particular presenting concern, suggesting that both disorders should be addressed. PTSD symptoms may also worsen with early recovery from substance abuse and traditional substance abuse treatment programs do not often address the increased psychiatric needs of those with PTSD.

Treatment Approach for Seeking Safety

Seeking Safety is rooted in five central principles: (a) safety is the number one priority of the first stages of treatment; (b) PTSD and substance abuse symptoms should be addressed simultaneously in first-stage treatment; (c) there should be sufficient focus on ideals and values; (d) treatment should integrate cognitive, behavioral, interpersonal,

and case management approaches; (e) attention is given to therapist processes (Najavits, 2002a). Fundamental to this treatment is the notion that safety is crucial in early stages of treatment as both active substance abuse and PTSD symptoms tend to put individuals at risk for physical and emotional danger. Within this approach to treatment, safety is a general term used to describe various behaviors and situations that decrease personal risk (e.g., continued substance abuse, risk of HIV exposure, dangerous relationships). The underlying philosophy for the increased emphasis on safety is that, during traumatic events, personal safety is compromised, and as such, regaining personal safety can serve the functions of both empowerment and freedom from the traumatic event.

Seeking Safety is a flexible approach to treatment, and session topics can be presented in any order depending on clinicians' preference, clinical setting, and treatment contexts (Najavits, 2002a). Depending on the clinical setting, group enrollment may be open or closed because the treatment does not depend on information being presented in a particular order. However, clinicians should be mindful of the impact open enrollment may have on the group (e.g., reducing cohesion or perceived safety in the group).

Another way that Seeking Safety can be flexible is the number of sessions, length of session, and time between sessions (Najavits, 2002a). The full Seeking Safety protocol consists of 25 sessions; however, this can be adapted to the needs of the client population, clinic factors, and clinician preference. Although there can be flexibility in applying this treatment, each session is highly structured and consists of the following elements: check-in, quotation, topic material, check-out. Check-ins are relatively brief and consist of clients letting the group know how they are feeling in that moment.

During check-in, group facilitators refrain from offering reflection or interpretations. Following the check-in, group facilitators will offer the group a quote to introduce that day's topic. Next, facilitators will provide group members with additional information about the topic and open the group up for discussion. Throughout this discussion, group members are encouraged to relate the material to their personal experiences. Lastly, group will end with a brief check-out. Check-outs are usually structured and clients may be asked to answer a specific question (e.g., "name one thing that you got out of today's group") or may be encouraged to make a commitment for that week.

    As mentioned, the Seeking Safety protocol consists of topics related to four differing domains: cognitive, behavioral, interpersonal, and case management (Najavits, 2002a). Each of the 25 possible topics fall into either one of these domains or a combination of multiple domains. There are seven sessions dedicated exclusively to the cognitive domain and consist of the following: (a) PTSD: Taking back your power; (b) When substances control you; (c) Integrating the split self; (d) Creating meaning; (e) Discovery. In the "PTSD: Taking back your power" session, clients are provided with information about PTSD with the goal of beginning to foster a compassionate understanding of the disorder. The session on "When substances control you" helps clients identify whether they have a substance abuse problem and the impact that substance abuse has on PTSD recovery. The "Compassion" session focuses on continuing to foster self-compassion and loving kindness. "Recovery Thinking" deals with challenging thoughts that support substance use and aiming to replace them with recovery thinking. "Integrating the Split Self" session focuses on aiming on noticing and

integrating splits. Lastly, the "Discovery" session offers alternatives to the stuck thinking

often associated with PTSD and clients are challenged to act as if with the goal of

fostering hope, motivation, and commitment to goals.

Seven of the topics covered are related to strictly behavioral approaches (Najavits,

2002a) and cover: (a) Detaching from emotional pain, (b) Taking good care of yourself,

(c) Red and green flags, (d) Commitment, (e) Coping with triggers, (f) Respecting your

time, and (g) Self-nurturing. "Detaching from emotional pain" focuses on grounding

techniques. "Taking good care of yourself" provides clients an opportunity to explore

self-care behaviors.   "Red and green flags" focuses on identifying signs of danger and

signs of safety and explores the up-and-down nature of recovery. "Commitment" focuses

on making and keeping promises to both self and others. The "Coping with triggers"

session explores and identifies personal triggers of both substance use and PTSD and

offers a means of coping with such situations based on changing who you are with, what

you are doing, and where you are. "Respecting your time" focuses on time management

and balanced lifestyle. The session on "Self-nurturing" focuses on distinguishing

between safe self-nurturing behaviors (e.g., taking a bath, reaching out to supports) and

unsafe self-nurturing (e.g., substance use, "cheap thrills").

There are also seven topics related to the interpersonal domain (Najavits, 2002a),

which consist of: (a) Asking for help, (b) Honesty, (c) Community resources, (d) Getting

others to support your recovery, (e) Healthy relationships, (f) Setting boundaries in

relationships, and (g) Healing from anger. "Asking for help" encourages clients to

become more aware of their needs for help and how to get needs met. "Honesty" focuses

on the importance of being truthful in relationships, focusing primarily on the safety

aspects of honesty. "Community resources" provides clients with outside resources that

may be utilized to achieve self-identified goals for treatment. "Setting boundaries"

discusses the impact of trauma on personal boundaries and includes a discussion on

struggles with saying "yes" and saying "no." "Getting others to support your recovery"

has clients identify positive supports for their recovery goals. Beliefs about healthy and

unhealthy relationships are explored in the "Healthy relationships" session and clients are

encouraged to notice how their PTSD and substance abuse has resulted in unhealthy

relationships. Lastly, the "Healing from anger" session focuses on exploring the

functions of anger, including both constructive uses and destructive uses.

Seeking Safety also includes two sessions that are combinations of the main

domains (Najavits, 2002a) which include (a) Safety and the (b) Life choices game. In the

"Safety" session, often presented after the introductory session, clients are provided with

information about the importance of safety in recovery from both PTSD and substance

abuse. Additionally, clients are provided with over 80 concrete safety-specific coping

skills. The "Life choices game" session is often presented the week prior to termination

and clients are invited to play a game in which all material covered over the course of

treatment is reviewed. Within the context of this game, clients are presented with

challenging life events and asked how they would cope if presented with that situation.

The introduction and termination sessions tend to fall under the umbrella of case

management sessions (Najavits, 2002a). Information presented in the introductory

session includes introduction to the treatment, getting to know the group, and an

assessment of case management needs. In the termination session, clients are encouraged to express their feelings about ending treatment, reflection of personal growth and progress, and if needed, referrals for further treatment are made.

Empirical Support for Seeking Safety

A summary of the empirical studies on the efficacy of Seeking Safety is outlined in Table 4. As shown, there were four studies identified, all of which compared the efficacy of Seeking Safety to a treatment-as-usual condition (Boden et al., 2011; Ghee, Bolling, & Johnson, 2009; Najavits, Gallop, & Weiss, 2006; Zlotnick, Johnson, & Najavits, 2009). Results from these studies indicated that Seeking Safety was beneficial in reducing symptoms of PTSD; however, results are mixed when it comes to substance use. Ghee et al. (2009) found that Seeking Safety was not associated with decreased relapse at 30-day follow up. However, Boden et al. (2011) found that Seeking Safety yielded more positive outcomes related to sustained abstinence.

Treatment Limitations, Critiques, and Further Considerations for Seeking Safety

A key consideration for the implementation of Seeking Safety is the balancing of treating two psychological disorders simultaneously (Najavits, 2002a). Individuals who enter treatment for co-occuring PTSD and SUD often experience high levels of distress and the distress of the two disorders often interact. The risk of an unbalanced approach to treatment may be poor prognosis for individuals. For example, too great a focus on SUD symptoms may lead to an increase in PTSD symptoms, which in turn may increase risk for a relapse of substance use. Conversely, too great a focus on PTSD symptoms may leave clients with insufficient capabilities to maintain sobriety.

Table 4

Summary of Empirical Studies on Seeking Safety

Study	Sample Size	Comparison	Outcome Measures	Tx Length	Assessment Phases	Results
Ghee et al. (2009)	N = 91 n = 91 (female) n = 0 (male)	TAU	TSC-40 SATI UA	6, 90 min group sessions (biweekly)	Pre-Tx Post-Tx 30 day F/U	SS was associated with decreased PTSD related symptoms at post-treatment SS was not associated with decreased relapse or overall trauma symptoms at 30 day follow up
Boden et al. (2011)	N = 98 n = 0 (female) n = 98 (male)	TAU	ASI CAPS	24, 90 minute group sessions (SS group only)	Pre-Tx 3 mo F/U 6 mo F/U	SS associated with superior drug use outcomes SS and TAU had similar outcomes for alcohol use and trauma symptoms

Table 4 (Continued)

Study	Sample Size	Comparison	Outcome Measures	Tx Length	Assessment Phases	Results
Zlotnick et al. (2009)	N = 49 n = 49 (female) n = 0 (male)	TAU	CAPS SCID BSI	18-24, 90 min group sessions (three x/ week)	Pre-Tx 3 mo F/U 6 mo F/U	Both groups had significant decreases on key domains SS was associated with more positive PTSD treatment outcomes compared to TAU
Najavits et al. (2006)	N = 33 n = 33 (female) n = 0 (male)	TAU	CAPS ASI SCS	25, 50 min (weekly; SS)	Pre-Tx Post-Tx 3 mo F/U	SS was associated with greater outcomes related to PTSD symptoms and SUD compared to TAU

Note. TAU = Treatment as Usual; TSC-40 = Trauma Symptom Checklist-40; SATI = Sexual Abuse Trauma Index; MSSR-SR = Modified PTSD Symptoms Scale, Self-Report; US = Urinalysis; F/U = Follow Up; ASI = Addiction Severity Index; CAPS = Clinician Administered PTSD Scale; SCID = Structured Clinical Interview for *DSM*; BSI = Brief Symptom Inventory; SCS = Self-Compassion Scale

Stress Inoculation Training

SIT was developed by Veronen and Kilpatrick (1983) as a means of treating the adverse effects of rape. The majority of research on this particular treatment tends to focus on its use with women survivors of rape or other types of sexual assault. There were no studies found that extended the use of SIT to other types of trauma and there were no studies found that test the efficacy of this treatment on men.

Theoretical Context for Stress Inoculation Training

SIT is a cognitive-behavioral approach (with a slightly greater emphasis on behavioral approaches) to treating the distress that results from a traumatic event, specifically that of a rape or sexual assault (Veronen & Kilpatrick, 1983). This approach to treatment posits that individuals' reactions to a rape may vary greatly depending on their cognitions, beliefs, expectations of people, and their cognitive framework. Underlying these differences in individual reactions to trauma are three theoretical underpinnings: expectancy theory, attribution theory, and cognitive appraisal.

Expectancy theory refers to the notion that individuals hold certain beliefs that some things will happen a certain way (Veronen & Kilpatrick, 1983). Individuals tend to vary on their expectancies of events and the actual events of a trauma often violate such expectations. Common expectations that are often violated by a traumatic event tend to center around themes of safety, trust, and general views and beliefs about rape.

Attribution theory refers to the notion that humans tend to have a compelling need to understand their experience and are constantly making appraisals and interpretations of environmental events and attaching meaning to them (Veronen & Kilpatrick, 1983). Put

more simply, attribution theory is the underlying assumption behind cause-and-effect thinking and is commonly expressed as, because of X, Y happened. From this perspective, individuals have more perceived control over a situation when they have a reason for the event, rather than the belief that things happen at random with no predictability. Overall, these types of beliefs may relieve some distress so that people are not in a constant state of worry. However, when events, such as rape, happen, individuals will often create reasons or explanations for the event to maintain some sense of control.

Lastly, cognitive appraisal refers to the process in which individuals attribute meaning and interpretation to an event (Veronen & Kilpatrick, 1983). Following a rape or other trauma, from this perspective, individuals will often attribute meaning to the event, which manifests in many areas, such as meaning about themselves, the attack, the perpetrator. While these appraisals and attributed meaning often feel like truth to individuals, it is important to note that these beliefs are often not substantiated by fact, but rather, they are misinterpretations of the actual event often leading to further psychological distress.

Failure to navigate any one of these three reactions (i.e., expectancies, attributions, appraisals) often leads to distress, which may present as symptoms of PTSD, depression, interpersonal conflict. (Veronen & Kilpatrick, 1983). A clear example of how these failures often manifest is through self-blame for the rape, which crosses all three of these domains. Regarding expectancy theory, individuals often report that the trauma of a rape violates their core beliefs about the world and others and may, for example, manifest in feeling as though no men can be trusted following a rape. Further,

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self-blame can be seen through faulty navigation of attribution theory and may express in thoughts, such as "if I hadn't been alone with the rapist, this wouldn't have happened." Building on this, some individuals may interpret the trauma as somehow being their fault.

From a behavioral perspective, this approach to treatment also builds on the concepts of classical conditioning (Veronen & Kilpatrick, 1983). Following the wake of a traumatic event, seemingly neutral stimuli (unconditioned stimuli) may become associated with the trauma event (conditioned stimuli), resulting in an anxiety or fear reaction (conditioned response). Over time, patterns of avoiding conditioned stimuli are often reinforced (through the reduction or avoidance of anxiety and fear), thus maintaining these behavioral patterns. Building on this, Veronen and Kilpatrick (1983) also make the argument that thoughts and other internal experiences may be conditioned stimuli to the trauma event, which becomes a focus over the course of therapy. Vernon and Kilpatrick further argued that the impact of trauma is more complex than a simple stimulus-response model, noting that individuals' cognitions (i.e., perception, beliefs, expectations) interact with the trauma event, making these learned patterns even more complicated.

Based on these theoretical underpinnings, SIT proposes explicit rationales for the approach taken to trauma treatment (Veronen & Kilpatrick, 1983). First, anxiety is a part of the human experience and one goal of SIT is to learn to manage anxiety rather than eliminate it. Second, SIT has been designed as a flexible treatment that can be applied across a variety of clinical settings. Third, SIT heavily emphasizes the importance of exploring the internal dialogue and cognitions that are often self-defeating, self-blaming,

or flashbacks. Lastly, SIT encourages clients to take an active role in their treatment with the goal of increasing empowerment, use of coping skills, and autonomy.

Treatment Approach for Stress Inoculation Training

SIT was originally created as an individualized approach to treatment (Veronen & Kilpatrick, 1983); however, it has since been applied and adapted to working with couples and groups. Typically, SIT is delivered in approximately 8 to 15 sessions of 60 minutes each. SIT was also designed to be a flexible and individualized treatment, and as such, may be adapted in number or duration of sessions.

Being a CBT approach to the treatment of trauma, SIT focuses on both target behaviors as well as challenging ineffective cognitions (Veronen & Kilpatrick, 1983). However, prior to beginning to address ineffective actions and maladaptive thoughts, SIT starts with an education phase. The goals of the education phase are to provide clients with psychoeducation, normalization, and validation regarding anxiety, trauma reactions, and an overview of classical conditioning. Within the framework of this education phase, anxiety and fear are presented as normal, human experiences. Further, clients are provided with information about the three channels in which anxiety and fear are learned, including behavioral (motoric), cognitive, and physical (autonomic).

Following the education phase, SIT shifts focus to behavioral strategies starting with the acquisition and rehearsal of concrete coping skills (Veronen & Kilpatrick, 1983). The introduction to coping skills builds on the education phase and specifically addresses fear and anxiety through the behavioral channel. Coping skills acquisition is achieved through psychoeducation in which clients are provided with information about six coping

skills (e.g., muscle relaxation, breath control, role-playing, covert modeling, thought stoppage, guided self-dialogue). Coping skills rehearsal is addressed in session through covert modeling and role-playing.

The third, and final, phase of this treatment consists of application and follow through (Veronen & Kilpatrick, 1983). In this phase of treatment, clients are encouraged to practice the application of skills acquired in therapy *in vivo*. In addition to practicing these skills outside of therapy, this stage of treatment utilizes a variety of in-session techniques to further clients' abilities and comfort with newly acquired skills, including imagery, behavioral rehearsal, modeling, and role playing. Another key component of this stage of treatment is the focus on relapse prevention, which addresses identifying high risk situations, warning signs, coping with lapses, among other themes.

Following the application and follow-through stage of treatment, SIT has built in booster and follow-up sessions, which may be conducted over a three- to 12-month period (Veronen & Kilpatrick, 1983). The purpose of these sessions is to continue to explore and reinforce effective coping skills use. Additionally, during this stage, difficulties or lapses in coping skill use are addressed.

Empirical Support for Stress Inoculation Training

As shown in Table 5, there were only two empirical studies that met the inclusion criteria for this study (Foa et al., 1991; Foa et al., 1999). Across both these studies, SIT was compared to PE or a combination of PE-SIT. Additionally, both these studies found that, compared to SIT, PE had superior symptom reduction at follow up and that PE was associated with greater overall effect sizes of treatment effect.

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Table 5

Summary of Empirical Studies on Stress Inoculation Training (SIT)

Study	Sample Size	Comparison	Outcomes	Tx Length	Assessment Phases	Results
Foa et al. (1991)	N = 45 n = 45 (female) n = 0 (male)	PE SC WL	RAST STAI BDI MBCS	9, 90-min sessions (biweekly)	Pre-Tx Post-Tx 3 mo F/U	All groups saw a decrease of symptoms at post-treatment PE had superior symptom reduction at follow up
Foa et al. (1999)	N = 96 n = 96 (female) n = 0 (male)	PE PE-SIT WL	SCID PSS-I SAS BDI STAI	2, 120-min sessions (weekly) followed by 7, 60-min sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U 6 mo F/U 12 mo F/U	All active treatments reduced PTSD and depression severity at post-treatment PE had greater reduction of PTSD symptoms and global adjustment at follow up and had greater overall effect sizes

Note. PE = Prolonged Exposure; PE-SIT = Combined Prolonged Exposure plus Stress Inoculation Training; WL = Waitlist Control; RAST = Rape Aftermath Symptom Test; STAI = State Trait Anxiety Inventory; BDI = Beck Depression Inventory; MBCS = Motivation for Behavior Change Scale; Tx = Treatment; F/U = Follow Up

Treatment Limitations, Critiques, and Further Considerations for Stress

Inoculation Training

A key consideration of this treatment is to focus on a client-driven approach, rather than a therapist-focused approach to treatment (Veronen & Kilpatrick, 1983). Veronen and Kilpatrick (1983) make this a key point because, they argue, treatment preference and approach has historically been a therapist-made decision and that working with this population, increasing client empowerment and autonomy seems to be of clinical importance. Further, they noted that when working with trauma, treatment should be individualized and customized to meet the client's needs.

Some factors that may relate to the lack of research on SIT for trauma could be that SIT has been generally used as a treatment for anxiety (Meichenbaum, 1985), stressful medical procedures (Kendall, 1989), chronic pain (Wernick, 1983), and obsessive and compulsive type disorders (Roskies, 1983), which may have resulted in a research focus of SIT on decreasing anxiety symptoms, rather than explicitly measuring the efficacy of PTSD-related symptoms. While there is substantial overlap between anxiety and PTSD symptoms, there are key differences in manifestation that may lead to inherent differences between the efficacy of SIT for pure anxiety as opposed to PTSD. Further research in this area is clearly needed to explore and address this gap in the available literature.

Psychological Debriefing

Psychological debriefing is a general term used to describe a variety of early intervention approaches to trauma treatment (Bisson et al., 2004). Psychological

debriefing differs from many other treatments for trauma in that it is a primary

intervention that is prescribed to wide masses of individuals following a traumatic

experience. Psychological debriefing has been used under many different labels,

including critical incident stress debriefing, crisis management, crisis intervention, and

acute preventative intervention. In general, psychological debriefing has key features,

including being a short-term, issue-oriented, and response limited. That is the counselor

deals primarily with crisis-related problems and does not stray to other issues, and the

counselor takes an active role in follow-up contacts (Veronen & Kilpatrick, 1983).

Theoretical Context for Psychological Debriefing

Psychological debriefing is based on the proximity, immediacy, and expectancy

(PIE) model (Bisson et al., 2004). Psychological debriefing has its formal roots within

the context of activity duty military in which intervention was prescribed in the event of

exposure to combat (proximity). Further, intervention is delivered as soon as feasible

(immediacy), and following the intervention, individuals return to normal duties

(expectancy). Since its start, however, psychological debriefing, in its various forms, has

since been applied to other types of trauma, such as natural disasters and rape. Building

on the PIE model, psychological debriefing presents PTSD as unique from other mental

illnesses in that the catalyst for the disorder is known (i.e., the traumatic event; Bisson et

al., 2004). Therefore, the underlying assumption with the treatment is that early, primary

intervention can serve as a buffer between the traumatic event and psychological distress

in the future. Psychological debriefing is prescribed to all individuals who have

experienced a particular event, and as such, no screening or diagnostic criteria are used to determine appropriateness of this intervention.

Treatment Approach for Psychological Debriefing

Psychological debriefing will be described based on the Bisson et al. (2004) definition. This approach to treatment, based off of earlier models described by Mitchell (1983), consists of semi-structured interventions with the expectation of serving as a buffer between a traumatic event and psychological distress by fostering emotional processing of the event through normalization of the stress reactions and preparation for future trauma-related reactions. In support of the normalization process, psychological debriefing avoids labeling or diagnosing individuals as a part of the intervention; rather, it describes individuals as having a normal reaction to an abnormal situation.

As described by Bisson et al. (2004), psychological debriefing consists of seven stages of the intervention: (a) introduction, (b) expectations and facts, (c) thoughts and impressions, (d) emotional reactions, (e) normalization, (f) future planning and coping, and (g) disengagement. The "Introduction" stage of psychological debriefing provides participants with an overview of the debriefing session, which includes a brief summary of the aforementioned stages. The "Expectations and facts" stage outlines the specifics of the event that occurred. The purpose is to provide participants with as much information about the situation as is available and to serve as a means of debunking any rumors or inaccurate information about the situation to which participants may have been exposed.

The "Thoughts and impressions" stage addresses individuals' reactions to the event (Bisson et al., 2004). Specifically, participants may be asked about their thoughts

related to the event. Next, during the "Emotional reactions" stage, participants are

encouraged to share their emotional reaction to the events and may be prompted to share

common emotional reactions, such as fear, helplessness, anger, guilt, anxiety, and

helplessness. Building on both of these, the "Normalization" stage focuses on

highlighting the similarities and commonalities of individuals' experiences shared about

the trauma. The goal here is to reiterate that, in general, when exposed to traumatic

crises, individuals have normal reactions to a situation that violates their beliefs about the

world.

The "Future planning and coping" stage of psychological debriefing focuses on

symptom management, which may occur in the months following the event (Bisson et al.,

2004). Within this conversation, both internal mechanisms, such as coping skills, and

external supports, such as family and friends, are presented. Lastly, the "Disengagement"

stage provides participants with additional information, such as referral sources for future

needs, psychoeducational materials about traumatic events and trauma-related disorders,

and information that may be used to help individuals determine if they should seek

further psychiatric or psychological support.

In addition to this approach, psychological debriefing may also be used to

describe other interventions, including narrative tradition (Marshall, 1994), crisis

intervention, grief counseling, catharsis (Breuer & Freud, 1893). The narrative tradition

involves recounting the traumatic experiences as a group as a means to evoke spiritually

purging and morale-building experiences. Grief counseling is typically prescribed

following the death of a loved one, and is a non-directive approach to psychotherapy that

provides clients with space to explore and process their losses. Catharsis refers to the process of releasing of tension and anxiety achieved through bringing repressed emotions and memories into conscious awareness.

Empirical Support for Psychological Debriefing

Division 12 of the APA has deemed that research does not support the efficacy of psychological debriefing as a treatment for PTSD (Hajcak & Starr, n.d.). Further, some research reviewed indicated that psychological debriefing may actually be harmful (van Emmerik et al., 2002). Specifically, van Emmerik and his colleagues found that psychological debriefing was associated with increased PTSD symptoms compared to those not given psychological debriefing.

Treatment Limitations, Critiques, and Further Considerations for Psychological Debriefing

As mentioned, psychological debriefing has not been supported by the research as an effective treatment for PTSD (Hajcak & Starr, n.d.). First, it is believed that psychological debriefing, through a mechanism that is not fully understood, interrupts the naturally healing process following a traumatic event. Second, it would appear that primary interventions (i.e., those given to all those exposed to the same risk factor) do not fully account for the fact that individuals respond differently to traumatic events and that a one-size-fits-all approach to treatment is not effective. Although it might seem intuitive to provide early intervention following a traumatic event, in practice debriefing does not create an effective buffer between exposure to trauma and future psychological distress.

Litz (2008) argues that this one-size-fits-all approach is not only infeasible, but often unnecessary as not everyone exposed to trauma will need intervention.

While there are some significant problems associated with to psychological debriefing, the approach of early intervention does still appear to have some merit (Bisson et al., 2004).   Specifically, psychological debriefing and providing information may appear to be beneficial when prescribed as a secondary intervention, given to those demonstrating some signs of risk for developing future distress in the future. Additionally, psychological debriefing does provide a unique opportunity to provide participants with information about further treatment and referral sources, which may be beneficial for individuals who may be in need of more comprehensive trauma treatment.

Eye-Movement Desensitization and Reprocessing

Eye-Movement Desensitization and Reprocessing (EMDR) is an approach to treating PTSD that was developed by Shapiro (1995). EMDR is a cognitive-behavioral approach to treatment that incorporates an exposure component. What differentiates EMDR from most other cognitive-behavioral approaches to treatment is the incorporation of bilateral stimulation during exposure.   As implied by the name, the most common form of bilateral stimulation is achieved through eye movements to the left and right in session during guided exposures. However, there are other means of achieving bilateral stimulation, such as alternating finger taps or sounds.

Theoretical Context for Eye-Movement Desensitization and Reprocessing

Unlike other psychological treatments, EMDR was not based on a theoretical model. Rather, the foundation of EMDR came from the personal and clinical experiences

of the developer (1995). Specifically, Shapiro (1995) described walking through a park one afternoon feeling particularly worrisome, when she noticed birds swiftly flying by throughout her walk. Shapiro (1995) further describes noticing decreases in her distress as she moved her eyes to follow the paths of the moving birds. These observations later became the foundation of what is now known as EMDR.

While not specifically driven by psychological theory, interventions in the EMDR protocol do converge with other theoretical orientations and approaches to PTSD, and as such, Shapiro (1995) described EMDR as an integrative treatment. Specifically, EMDR incorporates aspects of psychodynamic approaches, classical behaviorism, cognitive therapies, and a biological/physiological component. Regarding psychodynamic approaches, EMDR includes particular clinical attention to covering and uncovering techniques, such as those achieved through psychodrama, that strive to bring unconscious desires and emotions to the level of conscious awareness. Further, EMDR incorporates behavioral theories, including both classical and operant conditioning. Behavioral components of EMDR include teaching and coaching of coping skills, stress management techniques, as well as addressing specific (typically avoidance-driven) target behaviors to be either increased or decreased. It is of note that the behavioral and stress management components of EMDR are based on early SIT approaches to PTSD treatment (Meichenbaum, 1977; Shapiro, 1995).

The desensitization phase of EMDR is focused almost exclusively on cognitive approaches stemming from both CBT and rational emotive behavior therapy (REBT; Ellis & Ellis, 2011). Desensitization serves the function of integrating new, desirable,

and effective self-statements, which aid in the process of rapidly desensitizing clients to traumatic cues. Cognitive approaches are used to explore and challenge maladaptive cognitions associated with the trauma.

The biological/physiological component of EMDR is rooted in accelerated information processing theory (Shapiro, 1995). Information processing theory is a model to explain the means by which information is processed and consolidated into an adaptive resolution. From this perspective, an adaptive resolution is viewed as one in which there is an appropriate association made between existing experiences and individual beliefs. Maladaptive resolutions occur when experiences and schemata are incongruent or contradictory, resulting in an inability to reconcile or store the information related to the experience. Failure to adaptively process the events of the trauma often manifests itself through the positive symptoms of PTSD (e.g., flashbacks, intrusive thoughts, nightmares).

EMDR builds on information processing theory through the incorporation of eye movements, which are theorized to increase the rate of information processing. While the exact mechanism in which eye movements increase the rate of information processing remains unknown, it is believed that the mechanism is somehow related to the information storage function of rapid eye movements (REM) that occur during deep sleep. Based on these notions, EMDR is founded on the clinical hypothesis that activating and reprocessing the trauma memory is necessary for recovery. Shapiro (1995) argued that the way to overcome the symptoms and distress related to a traumatic event is to reactivate the experience so that these experiences can be reprocessed in an

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adaptive way. While this method is similar to other exposure techniques, EMDR, through its incorporation of bilateral stimulation, is argued to be a process that can be implemented more quickly than traditional exposure techniques.

Treatment Approach for Eye-Movement Desensitization and Reprocessing

EMDR is an individualized approach to the treatment of PTSD that typically consists of approximately 12 sessions of 90 minutes duration (Shapiro, 1995). Basic components of the treatment protocol consists of the image, the negative cognition, the positive cognition, the emotions and their level of disturbance, the physical sensations, and the eye movements (or alternative bilateral stimulation task). The image component of this treatment is the activation of the memories of the trauma event and is achieved by having clients bring to mind the image of the trauma itself. The purpose is to establish the link between consciousness and the location in the brain where this information is stored.

The negative cognition aspect of the protocol focuses on identifying negative thoughts associated with the trauma event (Shapiro, 1995). Negative cognitions are incorporated into treatment in order to identify maladaptive processing that has occurred following the trauma event. The positive cognition aspect, in contrast, has clients identify more positive thoughts as a means of challenging and eventually replacing negative ones. When identifying positive cognitions, clients are encouraged to use "I" statements (e.g., "I feel angry") as a means of increasing the internal locus of control of their experience. During both of these stages, clients are frequently asked to rate their subjective level of belief in a particular thought, ranging from completely false to

completely true. For example, during this part of treatment, clients may work toward shifting the thought of "getting raped was my fault" to something more adaptive and realistic, such as "I did the best I could to protect myself."

The emotions and their level of disturbance are also explored in EMDR (Shapiro, 1995). Emotions are often explored in conjunction with the image of the traumatic event so that clients can experience the emotion and rate the intensity of the emotions as they are being experienced in the moment. Additionally, emotional intensity (measured in subjective units of discomfort, which is a self-report measure of distress intensity) in the moment are contrasted with the emotional intensity of the actual trauma event. In addition to noticing emotions and their intensity, EMDR clients are also tasked with identifying their physiological responses to the trauma memory, such as muscle tightness, increased heart rate, and shakiness.

As mentioned, a unique feature of EMDR is the incorporation of eye movements (Shapiro, 1995). The stimulus guiding the eye movements is typically placed approximately 12 to 14 inches away from client eyes and moves from right to left at an even pace. Eye movements were originally stimulated by having therapists move their arm to direct the eye movement; however, more modern applications of EMDR have utilized computerized trailing dots, vibrating eggs held in the hands, and alternating pitch sounds that provide a more uniform and consistent approach to bilateral stimulation.

These focal points of the treatment are addressed across eight distinct phases (Shapiro, 1995). The number of sessions for each phase will vary depending on the needs of the clients. The first phase of treatment consists of client history and treatment

planning. The second phase, preparation, provides clients with an overview of the

EMDR approach to treatment, expected outcomes, and information about EMDR theory.

Additionally, this stage addresses and prepares clients for the potential of increased

distress in between sessions, especially during early stages of treatment. The third stage,

assessment, focuses specifically on identifying target behaviors and baseline measures of

subjective units of distress.

      The fourth stage consists of desensitization (Shapiro, 1995). In this stage, the

primary focus is exploring and addressing the client emotional disturbances. The fifth

stage, referred to as the installation stage, focuses on the cognitive restructuring aspect of

treatment, which consists of challenging, modifying, and exploring maladaptive thoughts.

The sixth stage of treatment focuses on the evaluation and exploration of residual bodily

tension and sensations related to the trauma. During the seventh stage, treatment enters

the closure phase, which addressing growth and progress of treatment and debriefing of

the treatment. The final stage of treatment is referred to as the reevaluation phase of

treatment, and consists of a reevaluation of any assessments taken in earlier stages of

treatment. During this final stage of treatment, issues of termination, transition, and if

applicable, referrals for further treatment are all addressed.

Empirical Support for Eye-Movement Desensitization and Reprocessing

      A summary of the empirical studies investigating the efficacy of EMDR are

shown in Table 6. As shown, over 15 articles were identified, and among these studies,

EMDR has been compared to a waitlist control group (Rothbaum, 1997), treatment as

usual or standard care protocol (Marcus, Marquis, & Sakai, 1997), as well as PE (Marcus

et al., 1997).   Across these studies, research generally supports the efficacy of EMDR in reducing PTSD symptoms. One study (Devilly & Spence, 1999) did, however, find that the trauma treatment protocol (TTP), a trauma-sensitive CBT protocol, had superior symptom reduction that lasted longer than EMDR. Other studies (Marcus et al., 1997) found that EMDR yielded significantly greater outcomes compared to supportive counseling and did so in a lower dose response.

Treatment Limitations, Critiques, and Further Considerations for Eye-Movement Desensitization and Reprocessing

Compared to other treatments for PTSD, EMDR has been considered somewhat controversial (Davidson & Parker, 2001) with regard to the mechanism by which it appears to be effective in reducing PTSD symptoms (i.e., Cusack & Spates, 1999; Cahill, Carrigan, & Frueh, 1999). Specifically, these arguments revolve around the addition of bilateral stimulation to an exposure-based treatment. Content analyses regarding the additive benefit of eye movements have been mixed. Specifically, research reviewed by Davidson and Parker (2001) has been contradictory, finding that the eye movements do have a significant impact on increasing the treatment's efficacy while other research has found that the addition of eye movements does not significantly increase the efficacy of treatment. In response to this controversy, Shapiro (1995) noted that EMDR is a complex approach to treatment, and that due to the complex nature, independent components of the treatment, specifically that of eye movements, cannot be expected to have the same efficacy when not delivered as a part of the full EMDR protocol.

Table 6

Summary of Empirical Studies on Eye Movement Desensitization and Reprocessing (EMDR)

Study	Sample Size	Comparison Treatment	Outcome Measures	Tx Length	Assessment Phases	Results
Marcus et al. (2004)	N = 67 n = 53 (female) n = 14 (male)	SC	SCL-90 STAI	50 min individual sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U 6 mo F/U	Compared to SC, EMDR produces stronger and longer lasting reductions of PTSD symptoms at a lower dose
Marcus et al. (1997)	N = 67 n = 53 (female) n = 14 (male)	SC	SCL-90 STAI	50 min individual sessions (weekly;)	Pre-Tx Mid-Tx (session 3) Post-Tx	EMDR was associated with greater symptom reduction in a lower dose response

(continued)

Table 6 (Continued)

Study	Sample Size	Comparison Treatment	Outcome Measures	Tx Length	Assessment Phases	Results
Rothbaum et al. (2005).	N = 74 n = 74 (female) n = 0 (male)	PE WL + TAU	CAPS SCID BDI STAI	9, 90 min sessions (biweekly)	Pre-Tx Post-Tx 6 mo follow up	Both PE and EMDR demonstrated significant reduction of PTSD symptomatology PE and EMDR did not differ significantly in the amount of change from pre- to post-treatment or at follow up
Devilly et al. (1999)	N = 23 n = 15 (female) n = 8 (male)	TTP	CAPS STAI BDI SCL-90-R	8-9, 90 min sessions (weekly)	Pre-Tx Post-Tx 2 week F/U 3 mo F/U	TTP was associated with greater and longer lasting reductions of PTSD symptoms compared to EMDR
Rothbaum (1997)	N = 21 n = 21 (female) n = 0 (male)	WAIT	PSS RAST SATI	4, 90 min sessions (weekly)	Pre-Tx Post-Tx 3 mo F/U	EMDR was associated with reduction of both PTSD and depressive symptoms

Note. SCL-90 = Symptom Checklist 90; WAIT = Waitlist Control; TTP = Trauma Treatment Protocol; PE = Prolonged Exposure; TAU = Treatment-as-Usual; CAPS = Clinician Administered PTSD Scale; SATI = Sexual Abuse Trauma Index; SCID = Structured Clinical Interview for *DSM*; BDI = Beck Depression Inventory

Another clinical issue related to EMDR, building on the complexity of the treatment, is the level of required training, supervision, and certification prior to being able to providing EMDR (Shapiro, 1995). Currently, rights to train therapists in EMDR are exclusively owned by the EMDR Institute, Inc. Compared to other treatments and trainings, the exclusive right to train serves two functions. First, by overseeing all training, the EMDR Institute is able to regulate the level of training of all those certified to provide this treatment, which insures some level of competency and uniformity of the treatment provided. At the same time, the high cost and exclusive rights to train clinicians create substantial barriers for the practitioner population at large in terms of being able to deliver this treatment.

Other Treatments for PTSD

In addition to the treatments explicitly outlined throughout this chapter, there are additional treatments available for PTSD that are outside the scope of this dissertation for a variety of reasons, such as having insufficient studies to evaluate in a meta-analysis, are not psychological treatments, etc.. Such treatments include pharmacotherapy (Friedman, Davidson, Mellman, & Southwick, 2004), emotion focused therapy (Paivio & Pascual-Leone, 2010), brief psychodynamic therapy (Kudler, Blank, & Krupnik, 2004), hypnosis (Cardeña, Maldonado, van der Hart, & Spiegel, 2004), marriage and family therapy (Riggs, 2004), creative therapies (Johnson, Lahad, & Gray, 2004), acceptance and commitment therapy (Dewane, 2012), dialectical behavioral therapy (DBT; Linehan, 1993). While there may be some preliminary empirical support for these approaches to

treatment, they are outside the scope of this project because they have not been tested as extensively as the treatments selected for inclusion in the current meta-analysis.

Summary of Literature Review

The literature review provided above outlined the theoretical context, treatment approach, summary of empirical support, and treatment consideration for ESTs for PTSD as indicated by Division 12. While overlap between these treatments inherently exists, each treatment does contribute a unique and novel approach to treatment. Furthermore, as would be expected, each treatment has well-documented empirical support in the literature reviewed. Additionally, many of the treatments reviewed fall under the cognitive-behavioral paradigm. Prolonged Exposure is unique in that it heavily emphasis on the use of both imaginary and *in vivo* exposure exercises. Cognitive Processing Therapy is unique in its emphasis on stuck points and the use of writing and recounted based exposure assignments. Eye Movement Desensitization and Reprocessing is unique with the use of bilateral stimulation during exposure exercises. Present Centered Therapy is unique in that it focuses nearly exclusively on the present moment, rather than exploring reactions to the trauma itself. Stress Inoculation Training is unique in that it approaches the treatment of PTSD as an anxiety-based reaction to triggers of the traumatic event, and heavily emphasizes the use of concrete coping skills and anxiety-reduction methods. Seeking Safety is unique in its attempt to address symptoms of both PTSD and substance use simultaneously. Lastly, Psychological Debriefing is unique in that it is intended as a response-to-trauma treatment and is widely prescribed to all those who have experienced the trauma regardless of whether or not symptoms are present.

Study Purpose

The purpose of this dissertation is to expand on the current body of knowledge on PTSD treatments by conducting a meta-analysis on ESTs of PTSD as defined by the Society of Clinical Psychology (Hajcak & Starr, n.d.), which includes: (a) PE (Foa et al., 2007), (b) CPT (Resick & Schnicke, 1996), (c) SIT (Veronen & Kilpatrick, 1983), PCT (Classen et al., 2001), and (d) EMDR (Shapiro, 2001). Seeking Safety for co-morbid substance use disorder (Najavits, 2009) will also be excluded from the present study because of its unique group-only format and its focus on dually diagnosed individuals. For the purposes of this dissertation, other treatments for PTSD, including but not limited to ACT (Wasler & Hayes, 1998), DBT (Harned et al., 2010), Psychological Debriefing (McNally et al., 2003), and other Cognitive Behavioral Therapies (CBT; Follette et al., 1998) will not be included in the analysis due to lacking sufficient empirical research studies on the efficacy of their use specific to PTSD.

Hypotheses

Based on the available research, the following hypotheses are proposed:

$H1_a$: All treatments reviewed (i.e., Prolonged Exposure, Cognitive Processing Therapy, Present Centered Therapy, Eye Movement Desensitization and Reprocessing) will account for a statistically significant reduction in PTSD symptomatology following treatment (i.e., within subjects effect).

H1$_b$: Prolonged Exposure will have the strongest treatment effect on reducing

overall PTSD symptom severity compared to Cognitive Processing Therapy,

Present Centered Therapy, and Eye Movement Desensitization and

Reprocessing

H1$_c$: Treatments that include an exposure (imaginary or *in vivo*), such as

Prolonged Exposure, Eye Movement Desensitization and Reprocessing, and

Cognitive Processing Therapy, component will have a stronger treatment

effect on PTSD symptom reduction compared to treatments that do not

include exposure techniques, such as Present Centered Therapy.

H2$_a$: Gender, index trauma, co-morbid disorders, will not statistically

significantly moderate the efficacy of treatment.

H2$_b$: Empirically Supported Treatments for PTSD (i.e., Prolonged Exposure,

Cognitive Processing Therapy, Present Centered Therapy, Eye Movement

Desensitization and Reprocessing) will also have a statistically significant

secondary impact on reducing symptoms of co-morbid disorders, specifically

anxiety and depression.

H3: Treatment factors will not significantly moderate the efficacy of treatment.

CHAPTER III

METHODOLOGY

The primary purpose of this proposed dissertation is to examine the accumulated

evidence of support for PTSD treatments. Further, this study aims to test the relative

efficacy of four treatments that have received strong research support, including PE (Foa

et al., 2007), CPT (Resick & Schnicke, 1996), SIT (Veronen & Kilpatrick, 1983), and

EMDR (Shapiro, 2001). In order to evaluate the efficacy of these treatments, the

researcher will conduct a meta-analysis. The purpose of this chapter is to provide

background information about meta-analysis and to describe the specific meta-analytic

approaches that will be utilized in this study.

Meta-Analysis

Meta-analysis is an umbrella term for analyses and research methods that are used

to combine, analyze, and integrate findings from several published studies so that these

reviews can be used to drive further research, inform policy, and guide clinical practice

(Hunter & Schmidt, 2004; Lipsey & Wilson, 2001). More specifically, meta-analyses

aim to integrate the results of numerous individual studies, examine the differences in

results across various studies, combine samples across studies to reduce limitations of

small sample sizes, and examine effects within subsets of participants (Garg, Hackam, &

Tonelli, 2008). Additionally, compared to individual studies, meta-analyses are capable

of calculating much more precise estimations of effect sizes, which in turn, increases the

generalizability, level of evidence, and ability to generate new hypotheses to drive further research. Furthermore, meta-analyses have been deemed the platinum standard of evidence (Stegenga, 2011).

In general, meta-analyses consist of two major phases; however, each of these major steps can be parceled out in to smaller steps, which are discussed later in this chapter (Hunter & Schmidt, 2004; Lipsey & Wilson, 2001). The first phase in conducting a meta-analysis is to extract the results of each individual study that has been identified as part of the meta-analysis. During this phase, researchers take the summary statistics as well as expected estimations of chance or confidence intervals. Over the years, there have been many changes in what is typically reported in research articles, so there may be times in which researchers will have to make calculations from what is reported in the research study in order to obtain the values needed to conduct a meta-analysis. One of the clearest examples of this sort of change is the recent shift to include measures of effect sizes routinely in research studies, which were not typically done older pieces of research.

The second major phase of a meta-analysis is to determine the appropriate method for pooling the average of findings across studies (Field & Gillett, 2010). There are many methods for pooling findings, such as weighted or unweighted averages, which may be used when integrating and analyzing the results from many studies. Specific methods utilized for the purposes of this study are discussed in greater detail in later sections of this chapter.

Strengths of Meta-Analysis

One of the major strengths of conducting a meta-analysis is that it summarizes and synthesizes previous findings in a way that is not only sophisticated in design and statistical procedure, but also explicitly describe the steps used, allowing readers to make their own evaluations about the analysis (Lipsey & Wilson, 2001). Through the transparency of the procedures utilized in a given meta-analysis, readers are more fully informed about the generalizability and conclusions drawn from the study compared to other types of research reports that do not necessarily provide as much detail in this regard (Field & Gillett, 2010). Another major strength of meta-analyses is the focus on effect size rather than null hypothesis significance testing. While many of the behavioral and social sciences are moving toward an emphasis on effect size, there are still many studies published that focus primarily on significance, which can be greatly impacted by sample size. By focusing on effect sizes, conclusions are based on variance explained, rather than statistical significance, which increases the utility of meta-analyses when drawing conclusions.

Limitations of Meta-Analysis

A major limitation of meta-analysis is that it requires sufficient expertise to conduct. Compared to conventional literature reviews and systematic reviews, meta-analyses are more time- and labor-intensive. Another common criticism of meta-analyses is what is referred to as the apples and oranges issue, which is the notion that making comparisons across studies may not necessarily results in uniform comparisons. In other

words comparisons across studies may assume the measurement of variables to be more similar than they are in reality.

Procedure

There have been many proposed procedures for conducting meta-analyses (Lipsey & Wilson, 2001; Schulze, Holling, & Böhning, 2003; Rosenthal & DiMatteo, 2001). One of the most commonly used approaches within the behavioral sciences was proposed by Field and Gillett (2010), which is the procedure that will be utilized in this study. Field and Gillett outlined six major steps in conducting a meta-analysis: (a) literature search, (b) determination of inclusion criteria, (c) calculation of effect sizes, (d) conducting the basic meta-analysis, (e) evaluating publication bias, and (f) reporting the findings.

Literature Search

As recommended by Field and Gillett (2010), prior to formulation of the research questions and determination of inclusion criteria, researchers should first familiarize themselves with the current literature related to the topic of interest. Within this first cursory review, researchers should see what, if any, systematic or meta-analytic reviews have been conducted and further identify both needs and gaps in the current literature. Following this recommendation, current research has been reviewed, and gaps in the literature were identified (see Chapter II of this dissertation). Furthermore, in this preliminary review of the literature, few meta-analyses were found. However, these reviews identified more specific populations of interests, such as combat veterans (Goodson et al., 2011; Kitchiner, Roberts, Wilcox, & Bisson, 2012), outcomes other than

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PTSD symptomatology, such as impact of PTSD on relationship quality (Lambert, Engh, Hasbun, & Holzer, 2012), risk factors for PTSD development (Brewin, Andrews, & Valentine, 2000), and dropout rates in PTSD treatment (Imel et al., 2013). Other analyses were treatment specific, which included an unpublished dissertation using a meta-analysis to assess the efficacy of EMDR (Alto, 2001). Lastly, this cursory review of the literature included review of peer-reviewed published articles, unpublished dissertations, treatment manuals, and guidelines for clinical practice.

Search strategies utilized included searching online through EBSCO Host through the following databases: *Academic Search Complete, CINAHL Complete, MEDLINE, Millitary & Government Collection, PsychARTICLES, Psychology and Behavioral Science Collection,* and *PsychINFO*. Boolean search terms included combinations and variations of the following terms: *posttraumatic stress disorder, post traumatic stress disorder, post-traumatic stress disorder, PTSD, trauma treatment, prolonged exposure, stress inoculation therapy, eye movement desensitization and reprocessing, EMDR, cognitive processing therapy, present centered therapy, seeking safety,* and *psychological debriefing*. Additionally, original sources were pulled from references of reviewed articles, and all articles cited by Hajcak and Starr (n.d.) as evidence of the relevant treatments were also reviewed. Accompanying treatment manuals and other relevant books were also reviewed. Lastly, unpublished dissertations were also searched using the aforementioned search terms through the ProQuest database of dissertations. This initial review yielded approximately 100 peer-reviewed articles, 5 treatment manuals, and 1 dissertation, which were determined to be relevant to the current study. Specific

breakdowns of these sources by treatment for inclusion in the final meta-analysis will be presented in later sections of this dissertation.

Determination of Inclusion Criteria

When conducting a meta-analysis, researchers must be mindful of which studies are and are not included in the meta-analysis. In making these decisions, there are multiple factors to consider, including research methods and design, participant characteristics (e.g., age, population, cultural aspects, gender), key variables, and date of publication (Lipsey & Wilson, 2001).   For the purposes of this study, no restrictions of date were placed on inclusion criteria in order to increase the number of included studies as well as to account for treatments that were developed at differing years. Field and Gillett (2010) further recommended that inclusion criteria should be based on both conceptual and empirical factors. Put another way, studies should be included based on their conceptual relation to the research questions underlying the meta-analysis as well as methodological characteristics of the study in order to ensure the overall quality of the final meta-analysis. Based on these recommendations, the following inclusion criteria were used to determine study eligibility in the current meta-analysis:

1. Experimental or quasi-experimental design, utilizing a repeated measures design was used;

2. Participants met the criteria for a diagnosis of PTSD;

3. One available outcome measure of PTSD symptomatology was reported;

4. Intervention adherence to one or more of the following interventions: PE, SIT, CPT, PCT, or EMDR, was indicated;

5. Study was published in a peer-reviewed, scholarly journal.

In addition to inclusion criteria, specific exclusion criteria were also specified. Articles were explicitly excluded from this meta-analysis if they met the following criteria:

1. Authors did not report effect size data or necessary information for effect size calculations (i.e., means, standard deviation, *n*);

2. Authors reported secondary analysis (i.e., subsamples of primary samples);

3. Studies that could not be obtained through print, online resources, or interlibrary loan;

4. Studies had notable concerns with regard to methodology, measures used, or findings.

Calculation of Effect Size

In a meta-analysis, individual datum or scores are often expressed as a measure of effect size from previously conducted research (Lipsey & Wilson, 2001; Rosenthal & DiMatteo, 2001; Schulze et al., 2003). In general, an effect size is the magnitude or strength of the relationship between two scores (Cohen, 1988), and an effect size can be obtained for nearly all statistical tests. Effect sizes can be calculated for both within-subjects and between-subjects effects. Measures of effect size differ from classic null hypothesis significance testing in that effect sizes do not test whether or not a particular relationship is significant or not; rather, effect sizes give an estimate of the amount of

variance explained by a dependent variable from individual variables or sets of independent variables. Measures of effect size have many advantages over traditionally reported p values, such as being independent from sample size, being interpretable of varying degrees of magnitude, and being robust at minimizing Type I or Type II error.

There are many estimates of effect size that are often used in meta-analyses, such as Cohen's d, Pearson's r, Hedge's g, odds ratios (Field & Gillett, 2010). Cohen's d is comparable in many ways to Hedge's g in that both are estimations of effect size calculated as a form of standardized mean differences based on pooled variance (Grissom & Kim, 2005) and both effect sizes can be interpreted similarly (Cohen, 1988). Specifically, an obtained Cohen's d or Hedge's g of .30 is considered small, .50 moderate, and above .80 large (Cohen, 1988; Field & Gillett, 2010). The main difference between Cohen's d and Hedge's g is the way in which the variance is pooled. In Cohen's d, variance is pooled from each sample using n, whereas in Hedge's g, variance is pooled from each sample using $n - 1$ (Grissom & Kim, 2005). Differences between Cohen's d and Hedge's g are often negligible, especially in moderate to larger sample sizes.

Cohen's d was determined to be the most appropriate effect size for this meta-analysis for a variety of reasons. First, Cohen's d can be computed for both within-subjects and between-subjects mean differences (Field & Gillett, 2010). Additionally, Cohen's d is favorable when comparing samples of varying sizes, because it is a standardized mean difference (McGrath & Meyer, 2006). Lastly, this effect size was chosen because it could be calculated from the information presented in all studies that met inclusion criteria.

For the purposes of this study, effect size was calculated as Cohen's d based on the standard formula, where M_1 refers to pretest scores, M_2 refers to posttest scores, and σ refers to the pooled variance for within subjects effects (Cohen, 1988).

$$d = \frac{M_1 - M_2}{\sigma}$$

In studies that provided effect sizes in terms of Pearson's product moment correlation coefficients (r), these values were converted to d using the standard formula also provided by Cohen (1988).

$$d = \frac{2r}{\sqrt{(1 - r^2)}}$$

Obtained and computed measures of effect size will be provided in later stages of this dissertation.

Conducting the Basic Meta-Analysis

There are many different approaches to actually conducting a meta-analysis (Lipsey & Wilson, 2001; Rosenthal & DiMatteo, 2001; Schulze et al., 2003). Prior to conducting the meta-analysis, it is important to determine which method is most appropriate based on the research questions and available data (Field & Gillett, 2010). The two main types of meta-analysis are fixed- and random-effects models (Field & Gillett, 2010) and the main difference between these two approaches to meta-analysis is the source of error. In fixed-effects models, the main source of error is expected to be due to sampling from a population of studies. Random-effects models also include error due to sampling but these types of models also account for error that results from

sampling from superpopulations, which refers to the theorized and imaginary population. More simplistically, fixed-effects meta-analysis models consist of only one set of error terms and random-effects models consist of two error terms in the final calculations. Due to the unique variability of human behavior and real-world data, many researchers (e.g., Barrick & Mount, 1991; Field, 2003; Field & Gillett, 2010; Hunter & Schmidt, 2004; Osburn & Challender, 1992) have argued that random-effects models should be utilized in the social and behavioral sciences, and following this recommendation, the current dissertation will utilize a random-effects model to conduct the final meta-analysis.

The actual procedures of the meta-analysis in this study will utilize the formulae outlined by Hedges et al. (Hedges & Oklin, 1985; Hedges & Vevea, 1998). Homogeneity of effect sizes is first evaluated in terms of the Q statistic, which is expressed as:

$$Q = \sum_{i=1}^{k} w_i (Z_{d_i} - \overline{Z_d})^2.$$

Where k refers to the number of effect sizes, Z_{d_i} refers to individual standardized effect size, $\overline{Z_d}$ refers to the sum of all standardized effect sizes. Lastly, w_i refers to the weight of a particular effect size and is expressed as:

$$w_i = \frac{4N_i(1+d_1^2)}{8}.$$

The Q statistic follows a chi square distribution with $k-1$ degrees of freedom. A non-significant Q statistic indicates homogeneity among effect sizes.

Next, the weighted average effect size is calculated as:

$$\bar{Z}_d^* = \frac{\sum_{i=1}^{k} w_i^* z_{d_i}}{\sum_{i=1}^{k} w_i^*}.$$

Where w_i^* is the weighted within-study variance and defined as:

$$w_i^* = \left(\frac{1}{w_i} + \hat{\tau}^2\right)^2;$$

Where $\hat{\tau}^2$ is the between-study variance and defined as:

$$\hat{\tau}^2 = \frac{Q - (k-1)}{c};$$

Were c is a constant defined as:

$$c = \sum_{i=1}^{k} w_i - \frac{\sum_{i=1}^{k}(w_i)^2}{\sum_{i=1}^{k} w_i}.$$

These series of equations will yield the aggregate effect size for a given set of studies and whether or not the mean effect size, reported as d, is significant based on the z distribution. The last step to complete the meta-analysis for this study will be to calculate the confidence intervals of the aggregate effect size. Similarly, these intervals will be calculated utilizing formulae outlined by Hedges and colleagues (Hedges & Oklin, 1985; Hedges & Vevea, 1998). The first step in obtaining the confidence intervals is to compute the standard error of the standardized effect size by taking the square root of the inverted sum of the random-effects weights, which is expressed as:

$$SE(\bar{Z}_d) = \sqrt{\frac{1}{\sum_{i=1}^{k} w_i^*}}.$$

Next, the confidence interval of the population effect size is computed by multiplying the standard error by the critical value accounting for 95% of the population based on the z distribution ($z = 1.96$, two tailed), which is expressed as:

$$CI_{95\%} = \bar{Z}_d \pm 1.96 \, SE(\bar{Z}_d).$$

Evaluating Publication Bias

Regardless of the field, there is a bias in most journals to publish significant findings. In terms of conducting a meta-analysis, this tendency to print only significant findings may overestimate effect sizes, referred to as the publication bias (Field & Gillett, 2010). Put another way, research conducted that yields non-significant findings with small or meaningless differences rarely gets published, and as such, effect sizes included in meta-analyses may not include studies that do not find meaningful effects. By only having access to published articles that tend to put heavy emphasis on significant and meaningful findings, meta-analyses may not yield a representative sample of all studies conducted on a given topic. Rather, meta-analyses are limited to only what has been published, or is otherwise available, on a given topic area. The impact of publication biases, sometimes also referred to as the file drawer problem, on an individual meta-analysis cannot fully be controlled. However, due to the common publication practices, meta-analyses are still generally accepted regardless of this bias.

There are many ways to estimate publication bias (Field & Gillett, 2010). One common method is Rosenthal's fail-safe N (Rosenthal, 1979). The fail-safe N is calculated utilizing the standardized effect sizes and is expressed as (Rosenthal, 1979):

$$N_{fs} = \frac{\left(\sum_{i=1}^{k} z_i\right)^2}{2.706} - k.$$

The resulting fail-safe N is the number of unpublished (i.e., not included) studies needed to shift a significant meta-analysis to being non-significant.

Another method of examining publication bias is the use of funnel plots (Field & Gillett, 2010; Light & Pillemer, 1984). Funnel plots are a graphic display of the data that plots the effect sizes by sample size or standard error. An unbiased funnel plot will often show a cloud of data points that are symmetrical around the population effect size, which visually resembles an inverted funnel, hence the name (Field & Gillett, 2010). For the purposes of this meta-analysis, both Rosenthal's fail-safe N (Rosenthal, 1979) and funnel plots (Light & Pillemer, 1984) will be utilized to evaluate the potential impact of publication bias on the present study.

Data Analysis

Currently, SPSS v19.0 (IBM SPSS, 2013) does not include built-in algorithms to conduct a meta-analysis; however, utilizing the formulae outlined in this section, the main meta-analyses were conducted using Comprehensive Meta-Analysis v. 2.0. Furthermore, other programs utilized as needed for other aspects of this project, included Excel (Microsoft, 2010) to calculate effect sizes, R v3.0.2 (The R Foundation for Statistical Computing, 2013), and SPSS.

In addition to the narrative associated with a meta-analysis write-up, there are also two graphical representations of the findings that are often presented: Forest plots and funnel plots. Forest plots are used to show the relative strength of the treatment effect found in each study included in the meta-analysis. On a forest plot, the effects of the treatment for each study are plotted against a vertical line representing no effect.

In order to address each hypothesis, the following analyses will be conducted:

H1$_a$: All treatments reviewed (i.e., Prolonged Exposure, Cognitive Processing

Therapy, Present Centered Therapy, Eye Movement Desensitization and

Reprocessing) will account for a statistically significant reduction in PTSD

symptomatology following treatment (i.e., within subjects effect).

To test this hypothesis, meta-analysis utilizing a random-effects model was conducted. Evaluation of the treatment efficacy was assessed using through the following methods: (a) individual effect sizes extracted from individual studies were examined for statistical significance; (b) homogeneity across studies was examined; (c) pooled or treatment effects were examined in terms of magnitude and statistical significance. This hypothesis would be supported if the aggregate treatment effect for each treatment was statistically significant.

H1$_b$: Prolonged Exposure will have the strongest treatment effect on reducing

overall PTSD symptom severity compared to Cognitive Processing Therapy,

Present Centered Therapy, and Eye Movement Desensitization and

Reprocessing

To test this hypothesis, meta-analysis with categorical moderation was conducted. Aggregate treatment effects were compared using a mixed-methods approach. Additionally, heterogeneity between and within studies was examined. This hypothesis would be supported if the aggregate treatment effect of PE was significantly greater than the remaining treatments (i.e., EMDR, PCT, and CPT).

H1$_c$: Treatments that include an exposure (imaginary or *in vivo*), such as

Prolonged Exposure, Eye Movement Desensitization and Reprocessing, and

Cognitive Processing Therapy, component will have a stronger treatment

effect on PTSD symptom reduction compared to treatments that do not

include exposure techniques, such as Present Centered Therapy.

To test this hypothesis, meta-analysis with categorical moderation was conducted. Aggregate treatment effects were compared using a mixed-methods approach. Additionally, heterogeneity between and within studies was examined. This hypothesis will be supported if the aggregate treatment effect of interventions that include an exposure component (e.g., PE, CPT, EMDR) is significantly greater than treatments that do not include exposure (e.g., PCT).

H2$_a$: Gender, index trauma, co-morbid disorders, will not statistically

significantly moderate the efficacy of treatment.

To test this hypothesis, meta-analysis with categorical moderation was conducted. Aggregate treatment effects split by participant characteristics were compared using a mixed-methods approach. Additionally, heterogeneity between and within studies was examined. This hypothesis would be supported with non-significant differences across aggregate treatment effects when split by participant characteristic.

H2$_b$: Empirically Supported Treatments for PTSD (i.e., Prolonged Exposure,

Cognitive Processing Therapy, Present Centered Therapy, Eye Movement

Desensitization and Reprocessing) will also have a statistically significant

secondary impact on reducing symptoms of co-morbid disorders, specifically anxiety and depression.

This hypothesis was tested using meta-analysis with a random-effects model on outcomes related to depression and anxiety. This hypothesis would be support if the aggregate treatment effect across studies had a statistically significant effect on measures of anxiety and depression.

H3: Treatment factors will not significantly moderate the efficacy of treatment.

This hypothesis could not be tested using meta-analytic approaches due to high observed associations between treatment time and length of treatment. Therefore, this hypothesis could not be fully tested given the obtained data. Rather, tests of differences, including

Ethical Considerations

Given that the current study utilized archival, published data, there were no human subjects involved in the completion of this study. As such, the current study was considered to be IRB exempt. A memorandum outlining this can be found in Appendix A.

CHAPTER IV

RESULTS

The primary purpose of this study was to examine and compare the efficacy of

ESTs for PTSD. This chapter outlines the quantitative results of this meta-analytic study.

First, descriptive, exploratory, and preliminary analyses will be discussed, followed by

the primary analyses and testing of the research questions.

Study Descriptives

The final meta-analysis consisted of 30 unique studies, yielding 88 unique effect

sizes. Multiple effect sizes from one study were retained in the following instances: (a)

effect sizes were obtained from unique samples (e.g., Treatment 1, Treatment 2, waitlist

control), or (b) effect sizes were derived from different clinical outcomes (e.g., PTSD,

anxiety, depression). To avoid violations of the assumption of independence, multiple

effect sizes from the same participants were not analyzed together. Put another way,

analyses across different outcome measures were analyzed separately.

Data from studies were originally extracted from primary sources by the primary

author of this dissertation. All data were double checked for accuracy by a Ph.D.-level

experimental psychologist. Identified input errors ($< 5\%$) were corrected, indicating that

data was sufficiently and accurately extracted. Where applicable, reported data were

converted to necessary formats for consistency and as required by meta-analytic

procedures. Standard error of the mean values were most commonly converted to

standard deviation using the following formula:

$$SD = SE * \sqrt{N}$$

The full set of extracted data is available in Appendix B. Descriptives of effect

sizes used in primary analyses are outlined in Table 7. As shown, there were a total of 27

effect sizes for CPT, 22 for EMDR, 8 for PCT, 25 for PE, and 6 for SIT. The total effect

sizes for SIT were obtained from only two separate studies; therefore, based on the

recommendation outlined by Field and Gillette (2010), which states that effect sizes in a

meta-analysis should come from a minimum of three separate studies, SIT was excluded

from primary analyses. Potential moderating variables were also extracted from primary

sources where applicable. In order to be extracted, the potential moderator must have

been identified for the entire sample so that group-specific data could be extracted. As

also shown in Table 7, of the effect sizes that included a specific trauma type, 90.2%

identified rape, assault, or other forms of intimate partner violence as the target trauma.

Additionally, of those effect sizes that specified the target population, 57.6% were

identified as a veteran population, whereas 42.4% were identified as a civilian

population. Lastly, among studies that reported findings by sex, only 23.7% of the effect

sizes identified a sample of males, with 76.3% identified as female.

Preliminary Analyses

Prior to conducting the primary analyses for this study, a series of preliminary

analyses were conducted in order to confirm the assumptions of primary analyses,

including the absence of outliers among effect sizes and relative independence across categorical moderators. Preliminary analyses were conducted in SPSS v. 21 and significance for all tests was set at .05. Outliers were examined with Mahalanobis distance and observed values greater than 5 *SD*s above or below the mean were deemed outliers. None of the observed effect sizes met these criteria and, as such, all effect sizes were retained for primary analyses.

Table 7

Frequencies (k) and Percentages of Effect Sizes by Moderators

	K	%
Treatment		
CPT	27	30.7
EMDR	22	25.0
PCT	8	9.1
PE	25	28.4
SIT	6	6.8
Index Trauma		
IPV	37	90.2
Combat	4	9.8
Gender		
Female	29	76.3
Male	9	23.7
Population		
Civilian	28	42.4
Veteran	38	57.6

Note. Percentages reported are valid percents.

The associations between potential categorical moderating variables were examined using crosstabulations with Pearson's chi square test. Specifically, the associations between index trauma, population, and gender were tested. Additionally, these factors were also tested by intervention to evaluate whether or not a particular group was over or underrepresented by a particular intervention type. Significant associations were found between population and gender, χ^2 (3) = 9.40, p = .024, Cramer's V = .377, population and index trauma, χ^2 (1) = 8.66, p = .003, Cramer's V = .497, gender and population, χ^2 (1) = 32.00, p < .001, Cramer's V = 1.00, and trauma and gender, χ^2 (1) = 33.00, p < .001, Cramer's V = 1.00. These results indicated that there are strong associations among all three of these potential moderators (e.g., gender, population, index trauma), and as such, only one moderator could be tested because examining multiple moderators would likely be influenced by these associations. Population was chosen as the primary moderator because it was reported most frequently and was therefore able to be retained for the greatest number of effect sizes.

Primary Analyses

In order to evaluate the research questions and hypotheses, a series of meta-analyses were conducted using Comprehensive Meta-Analysis v. 2. For each meta-analysis conducted, multiple steps were taken to evaluate the overall treatment effect. Specifically, heterogeneity was examined in order to evaluate whether the amount of variability among observed effect sizes was greater than what would be expected due to chance. Next, the overall treatment effect was examined, which is expressed as a point estimate. The point estimate refers to the aggregate effect found across studies within the

same analysis. In other words, the point estimate is an estimation of the population effect of a given treatment. Comparisons across groups (e.g., treatment, population) were examined using a mixed random effects models to evaluate whether or not the point estimate between groups differed significantly.

Research Question One

Research Question One aimed to evaluate the efficacy of the EST for PTSD. Specific hypotheses related to this research question were as follows:

$H1_a$: All treatments reviewed (i.e., Prolonged Exposure, Cognitive Processing Therapy, Present Centered Therapy, Eye Movement Desensitization and Reprocessing) will account for a statistically significant reduction in PTSD symptomatology following treatment (i.e., within subjects effect).

$H1_b$: Prolonged Exposure will have the strongest treatment effect on reducing overall PTSD symptom severity compared to Cognitive Processing Therapy, Present Centered Therapy, and Eye Movement Desensitization and Reprocessing

$H1_c$: Treatments that include an exposure (imaginary or *in vivo*), such as Prolonged Exposure, Eye Movement Desensitization and Reprocessing, and Cognitive Processing Therapy, component will have a stronger treatment effect on PTSD symptom reduction compared to treatments that do not include exposure techniques, such as Present Centered Therapy.

To test the first hypothesis ($H1_a$), point estimates were calculated for each of the four treatments tested (see Figure 1 for an overview). Across all interventions, there was

significant observed heterogeneity, Qs >10.96, ps < .044, I^2 ranging from 49.73 to 94.84.

In order to account for heterogeneity between studies, a random effects model was used

to calculate the point estimate for each treatment.

For CPT, 11 of 12 obtained effect sizes were significant, $p < .001$, and the point

estimate was 2.224 (95% CI [1.537, 2.911]), $p < .001$. Regarding the non-significant

individual effect size (Resick et al., 1992), it is important to note that this effect size was

calculated from the SCL-90, which may not be a sensitive enough instrument to account

for improvements in PTSD symptomatology. These results are not unsurprising, given

that Carlozzi and Long (2008) have indicated that the PTSD subscale of the SCL-90

appears to be a unideminsional measure of PTSD symptoms and, as such, is less sensitive

to change compared to other measures of PTSD symptoms.

A forest plot of the treatment summaries is outlined in Figure 1. A forest plot

incudes the observed effect size and confidence interval for each individual study.

Additionally, the estimated treatment effect for each set of treatments is shown. In the

figure, individual effect sizes are shown as black squares with bars representing the

confidence interval, and summary treatment effects are shown as diamonds with the size

representing the confidence interval.

As shown in Figure 1, six of the eight individual effect sizes for EMDR were

significant, ps < .001. The point estimate for EMDR was 1.197 (95% CI [.511, 1.884]), p

< .001. All four of the individual effect sizes for PCT were significant, ps < .05. The

point estimate for PCT was .712 (95% CI [.328, 1.097]). Lastly, all nine of the individual

effect sizes for PE were significant, ps < .014. The point estimate for PE was 1.460 (95%

CI [1.257, 1.663]). Overall, these findings support the first hypothesis by providing

evidence for significant improvement in PTSD symptoms across all treatments evaluated.

Additionally, all of the estimated treatment effects were considered large effects or

stronger based on the cut offs suggested by Cohen (1988).

To assess hypothsis $H1_b$, differences in magnitude by treatment were evaluated

using a mixed effects model, see Table 8. As shown, there was a significant effect of

treatment type on effect size across treatment, $Q(3) = 24.49$, $p < .001$. Further pairwise

analyses indicated that CPT had a significantly greater point estimate (2.224) compared

to EMDR (1.197) and PCT (.712); however, CPT did not differ significantly from PE

(1.659). Evaluation of further pairwise comparisons indicated that there were no

additional significant differences in efficacy across treatments, which indicates that

observed effects across PE, CPT, and PCT were statistically similar.

These findings fail to support Hypotheses $H1_b$, which predicted that PE would

have the greatest treatment effect. Rather, results of this study would suggest that CPT

has superior treatment outcomes compared to EMDR and PCT. However, treatment

effects across CPT and PE did not differ significantly, indicating similar rates of

symptom reduction over the course of treatment. These results do, however, provide

partial support Hypothesis $H1_c$, which states that treatments with an exposure component

will have the largest effects. CPT, EMDR, and PE all include a clinical focus on

exposure. Additionally, treatment that did not include an exposure component (PCT) had

the lowest observed treatment effect; however, this effect size was not significantly lower

than that observed from EMDR and PE.

Study name	Comparison	Outcome	Std diff in means	Lower limit	Upper limit	p-Value
Alvarez et al. (2011)	CPT	PCL	0.713	0.433	0.994	0.000
Basharpoor et al. (2011)	CPT	PCI	2.139	1.270	3.008	0.000
Chard (2005)	CPT	CAPS	2.791	2.055	3.527	0.000
Chard (2010) - OEF/OIF	CPT	CAPS	2.082	1.600	2.564	0.000
Chard (2010) - Vietnam	CPT	CAPS	1.146	0.723	1.569	0.000
Suris et al. (2013)	CPT	CAPS	6.748	5.708	7.789	0.000
Galovski et al. (2012)	CPT	CAPS	3.743	3.031	4.454	0.000
Jeffreys et al. (2013)	CPT	PCL	2.688	1.568	3.809	0.000
Monson et al. (2006)	CPT	CAPS	2.355	1.697	3.014	0.000
Resick et al. (1992)	CPT	SCL-90-P	0.248	-0.408	0.904	0.459
Resick et al. (2002)	CPT	CAPS	1.388	0.996	1.781	0.000
Resick et al. (2008)	CPT	PDS	1.434	0.980	1.887	0.000
			2.224	1.537	2.911	0.000
Rothbaum (1997)	EMDR	PSS	2.220	1.075	3.364	0.000
Marcus et al. (1997)	EMDR	MPTSD	2.026	1.558	2.495	0.000
Devilly et al. (1998)	EMDR	MPTSD	0.369	-0.438	1.176	0.370
Devilly et al. (1999)	EMDR	PSS	1.613	0.651	2.575	0.001
Carlson et al. (1998)	EMDR	MPTSD	1.384	0.408	2.360	0.005
Vaughan et al. (1994)	EMDR	SI-PTSD	1.384	0.493	2.275	0.002
Jensen (1994)	EMDR	SI-PTSD	-0.498	-1.279	0.282	0.211
Forbes et al. (1994)	EMDR	SI-PTSD	1.197	0.133	2.261	0.027
			1.197	0.511	1.884	0.001
Schnurr et al. (2003)	PCT	CAPS	0.339	0.121	0.558	0.002
McDonagh et al. (2006)	PCT	CAPS	1.084	0.451	1.717	0.001
Schnurr et al. (2007)	PCT	CAPS	0.761	0.521	1.001	0.000
Ready et al. (2010)	PCT	CAPS	1.573	0.071	3.075	0.040
			0.712	0.328	1.097	0.000
Foa et al. (1999)	PE	PSS	2.037	1.325	2.749	0.000
Foa et al. (1991)	PE	PTSD	1.206	0.253	2.159	0.013
Foa et al. (2005) - S1	PE	PDS	1.436	0.982	1.889	0.000
Foa et al. (2005) - S2	PE	PDS	1.493	0.939	2.047	0.000
Hagenaan et al. (12010)	PE	CAPS	1.581	1.262	1.900	0.000
Rauch et al. (2009)	PE	PDS	2.192	1.083	3.301	0.000
Yonder (2011) - O/O/O	PE	PCL	2.501	2.027	2.975	0.000
Yonder (2011) - Viet.	PE	PCL	1.791	1.229	2.354	0.000
Yonder (2011) - GW	PE	PCL	1.687	0.904	2.469	0.000

Statistics for each study

Std diff in means and 95% CI

Single Study Effect Size ◆ Estimated Treatment Effect — Confidence Interval

-8.00 -4.00 0.00 4.00 8.00

Pre Post

Figure 1: Summary of Treatment Effects by Treatment Modality

Table 8

Summary of Treatment Effects

	K	Treatment Effect	95% CI LL	UL	*p*	*Q*	*p*	*I²*
CPT	12	2.224 [a]	1.537	2.911	< .001	213.24	< .001	94.84
PE	9	1.762 [a,b]	1.48	2.37	< .001	15.92	.044	49.73
EMDR	8	1.197 [b]	.511	1.884	< .001	37.72	< .001	81.44
PCT	4	.712 [b]	.328	1.097	< .001	10.96	.012	72.63
Total Within						277.84	< .001	
Total Between						24.49	< .001	

Note. Estimates with differing superscripts differed significantly, *p* < .05

Research Question Two

The second research question was aimed to evaluate the differences in treatment outcomes by client factors, and to address the following hypothesis:

H2$_a$: Gender, index trauma, and co-morbid disorders will not statistically significantly moderate the efficacy of treatment.

H2$_b$: Empirically Supported Treatments for PTSD (i.e., Prolonged Exposure, Cognitive Processing Therapy, Present Centered Therapy, Eye Movement Desensitization and Reprocessing) will also have a statistically significant secondary impact on reducing symptoms of co-morbid disorders, specifically anxiety and depression.

As previously discussed, there were significant and strong associations between all client factors. Therefore, to evaluate this research question, a series of moderation analyses were conducted within each treatment modality to test for differences in treatment effects by client population (e.g., veteran vs. civilian; see Table 9). PCT could not be included in these analyses due to a lack of participant level data because all effect sizes for PCT were provided from a veteran population. As shown in Table 9, patient population appeared to be a significant moderator of treatment efficacy. To determine where significant differences were found, further moderation by patient population was conducted within each treatment. For EMDR, civilian participants had a significantly greater response to treatment (2.054; 95% CI [1.621, 2.487]) compared to veteran participants (.385; 95% CI [-.645, 1.414]), Q (1) = 28.32, p = .003. The treatment effect for EMDR within a veteran population was not significant, p = .464.

Conversely, veterans who received CPT had greater treatment outcomes (2.728; 95% CI [1.690, 3.766]) compared to civilian patients (1.277; 95% CI [.678, 1.876]). Additionally, veterans had significantly greater improvement when receiving PE (2.076; 95% CI [1.643, 2.509]) compared to a civilian population also receiving PE (1.422; 95% CI [1.220, 1.623]). These results did not support Hypothesis 2_a, which predicted similar rates of improvement regardless of client characteristics.

The second research question also aimed to examine the effects of co-morbid symptoms. In order to evaluate this aspect of the second research question, additional meta-analysis was conducting on outcomes measures for depression and anxiety (see Figures 2 and 3). Data related to depression, as measured by the Beck Depression Inventory, was available for CPT, EMDR, and PE. As shown, all treatments had a significant effect on reducing depressive symptoms. Additionally, further moderation by group was conducted to examine potential differences in improvement of depressive symptoms by treatment, yielding no significant difference, $Q(2) = .61$, $p = .737$. These results indicated that all treatments produced improvements in depressive symptoms that were statistically similar in magnitude.

Anxiety, as measured by the State Anxiety subscale of the State-Trait Anxiety inventory, was available for EMDR and PE studies (see Figure 3). As shown, both of these treatments produced significant reduction in anxiety symptoms following the course of treatment. Moderation analysis by treatment indicated that both treatments produced similar improvements in anxiety symptoms, $Q(1) = .03$, $p = .861$.

Table 9

Summary of Treatment Effects by Population

	K	Treatment Effect	95% CI LL	95% CI UL	*p*	*Q*	*p*	*I²*
CPT								
Civilian	4	1.277	.678	1.876	< .001	14.00	.003	78.57
Veteran	8	**2.728**	1.690	3.766	< .001	193.82	< .001	96.39
Total Within						207.82	< .001	
Total Between						5.42	.020	
EMDR								
Civilian	2	**2.054**	1.621	2.487	< .001	.094	.759	.00
Veteran	3	.385	-.645	1.414	.464	8.78	.012	77.23
Total Within						8.87	.031	
Total Between						28.32	< .001	
PE								
Civilian	4	1.422	1.221	1.623	< .001	2.94	.401	.00
Veteran	4	**2.076**	1.643	2.509	< .001	4.99	.173	39.83
Total Within						7.92	.243	
Total Between						13.45	< .001	

Note. Estimates in boldface were significantly greater, *p* < .05

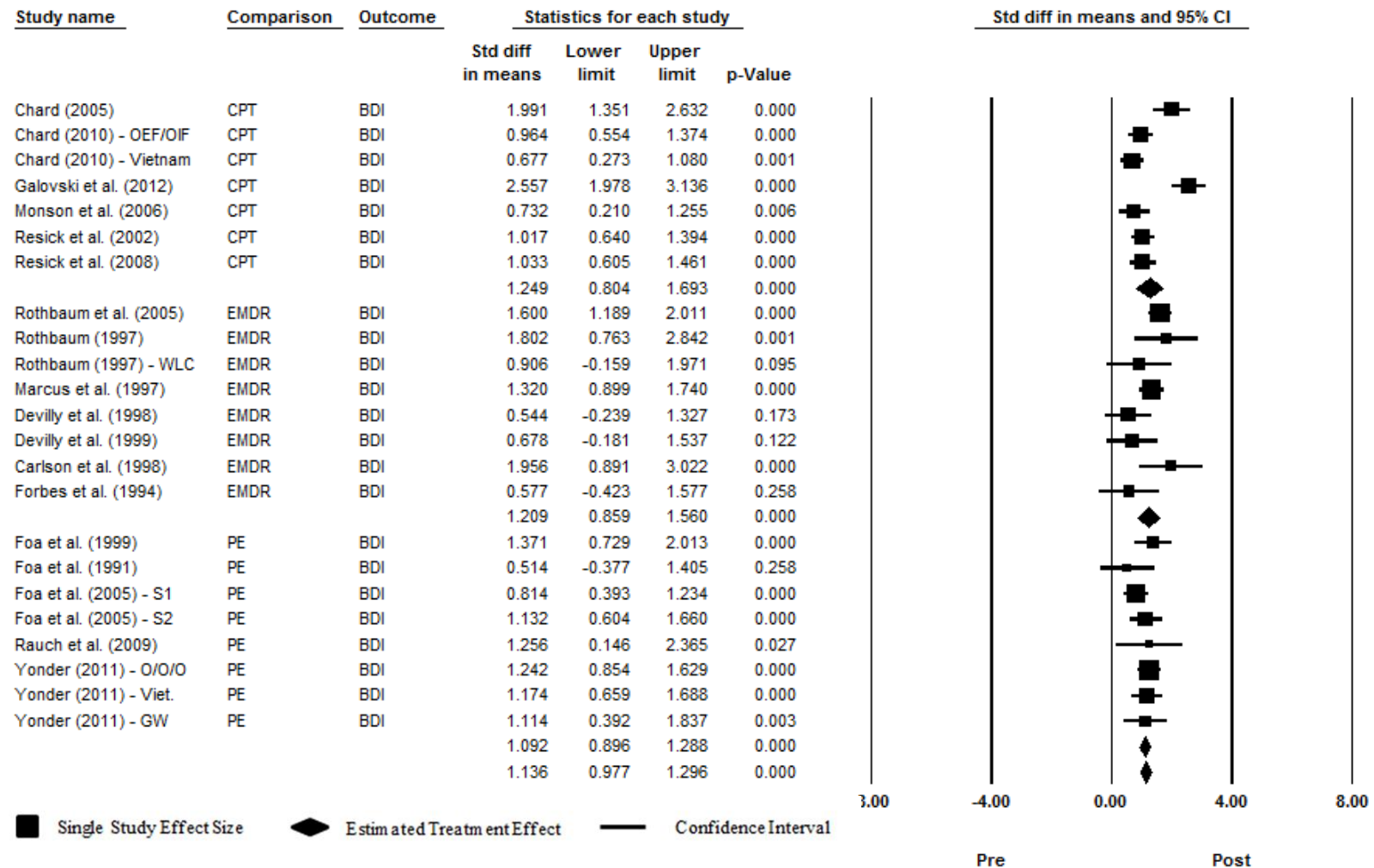| Study name	Comparison	Outcome	Std diff in means	Lower limit	Upper limit	p-Value
Chard (2005)	CPT	BDI	1.991	1.351	2.632	0.000
Chard (2010) - OEF/OIF	CPT	BDI	0.964	0.554	1.374	0.000
Chard (2010) - Vietnam	CPT	BDI	0.677	0.273	1.080	0.001
Galovski et al. (2012)	CPT	BDI	2.557	1.978	3.136	0.000
Monson et al. (2006)	CPT	BDI	0.732	0.210	1.255	0.006
Resick et al. (2002)	CPT	BDI	1.017	0.640	1.394	0.000
Resick et al. (2008)	CPT	BDI	1.033	0.605	1.461	0.000
			1.249	0.804	1.693	0.000
Rothbaum et al. (2005)	EMDR	BDI	1.600	1.189	2.011	0.000
Rothbaum (1997)	EMDR	BDI	1.802	0.763	2.842	0.001
Rothbaum (1997) - WLC	EMDR	BDI	0.906	-0.159	1.971	0.095
Marcus et al. (1997)	EMDR	BDI	1.320	0.899	1.740	0.000
Devilly et al. (1998)	EMDR	BDI	0.544	-0.239	1.327	0.173
Devilly et al. (1999)	EMDR	BDI	0.678	-0.181	1.537	0.122
Carlson et al. (1998)	EMDR	BDI	1.956	0.891	3.022	0.000
Forbes et al. (1994)	EMDR	BDI	0.577	-0.423	1.577	0.258
			1.209	0.859	1.560	0.000
Foa et al. (1999)	PE	BDI	1.371	0.729	2.013	0.000
Foa et al. (1991)	PE	BDI	0.514	-0.377	1.405	0.258
Foa et al. (2005) - S1	PE	BDI	0.814	0.393	1.234	0.000
Foa et al. (2005) - S2	PE	BDI	1.132	0.604	1.660	0.000
Rauch et al. (2009)	PE	BDI	1.256	0.146	2.365	0.027
Yonder (2011) - O/O/O	PE	BDI	1.242	0.854	1.629	0.000
Yonder (2011) - Viet.	PE	BDI	1.174	0.659	1.688	0.000
Yonder (2011) - GW	PE	BDI	1.114	0.392	1.837	0.003
			1.092	0.896	1.288	0.000
			1.136	0.977	1.296	0.000

Figure 2: Summary of Depression Outcomes by Treatment

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Study name	Comparison	Outcome	Statistics for each study				Std diff in means and 95% CI
			Std diff in means	Lower limit	Upper limit	p-Value	
Rothbaum et al. (2005)	EMDR	STAI-S	1.632	1.218	2.045	0.000	
Rothbaum (1997)	EMDR	STAI-S	1.451	0.466	2.437	0.004	
Rothbaum (1997) - WLC	EMDR	STAI-S	1.023	-0.055	2.101	0.063	
Marcus et al. (1997)	EMDR	STAI-S	1.047	0.641	1.453	0.000	
Carlson et al. (1998)	EMDR	STAI-S	1.337	0.367	2.306	0.007	
			1.324	1.048	1.601	0.000	
Foa et al. (1999)	PE	STAI-S	1.414	0.768	2.060	0.000	
Foa et al. (1991)	PE	STAI-S	1.298	0.334	2.263	0.008	
			1.378	0.841	1.915	0.000	
			1.335	1.090	1.581	0.000	

-8.00   -4.00   0.00   4.00   8.00

■ Single Study Effect Size   ◆ Estimated Treatment Effect   — Confidence Interval

Pre   Post

Figure 3: Summary of Anxiety Outcomes by Treatment

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Taken together, these results provide evidence for Hypothesis $H2_b$, by establishing significant decreases in symptoms related to both depression and anxiety. Furthermore, these improvements did not appear to differ as a function of treatment received, indicating that all treatments evaluated in these analyses yielded similar secondary improvement in co-morbid symptoms.

Research Question Three

Research Question 3 aimed at evaluating the impact of treatment factors on treatment efficacy and at evaluating the following hypothesis:

H3: Treatment factors will not significantly moderate the efficacy of treatment.

Due to limitations of available data, many treatment factors, such as training of clinicians, could not be sufficiently extracted from primary studies. Additionally, numerous studies included in this analysis reported data from an intent-to-treat sample. The main treatment factor that was available for analysis was session length; however, there was a significant association between treatment length and treatment type, which violated the assumptions of meta-regressions. To evaluate differences in treatment factors, a one-way analysis of variance (ANOVA) was conducted to test for differences in average treatment length by treatment. Due to a lack of variability in PCT studies, this treatment was excluded from analysis. Results yielded a significant effect of treatment on treatments length, $F(4, 55) = 48.98$, $p < .001$, $\eta^2_p = .797$. Tukey's post hoc analyses indicated that EMDR treatment had significantly fewer sessions ($M = 4.70$, $SD = 1.76$) compared to CPT ($M = 12.74$, $SD = 1.74$) and PE ($M = 9.77$, $SD = 1.4$). Additionally, CPT studies had significantly greater sessions than did PE studies.

Publication Bias

        To evaluate the potential effect of publication bias on the results of this meta-analysis, both funnel plots and the fail-safe N were calculated. The obtained funnel plot indicated some symmetry, suggesting low probability of a significant impact of publication bias on the results of this meta-analysis (see Figure 4). Results from the fail-safe N indicated that the current meta-analysis would require a total of 7,625 additional non-significant effect sizes to shift the findings to non-significance. The evaluation indicated a low probability of the results being greatly impacted by publication bias.
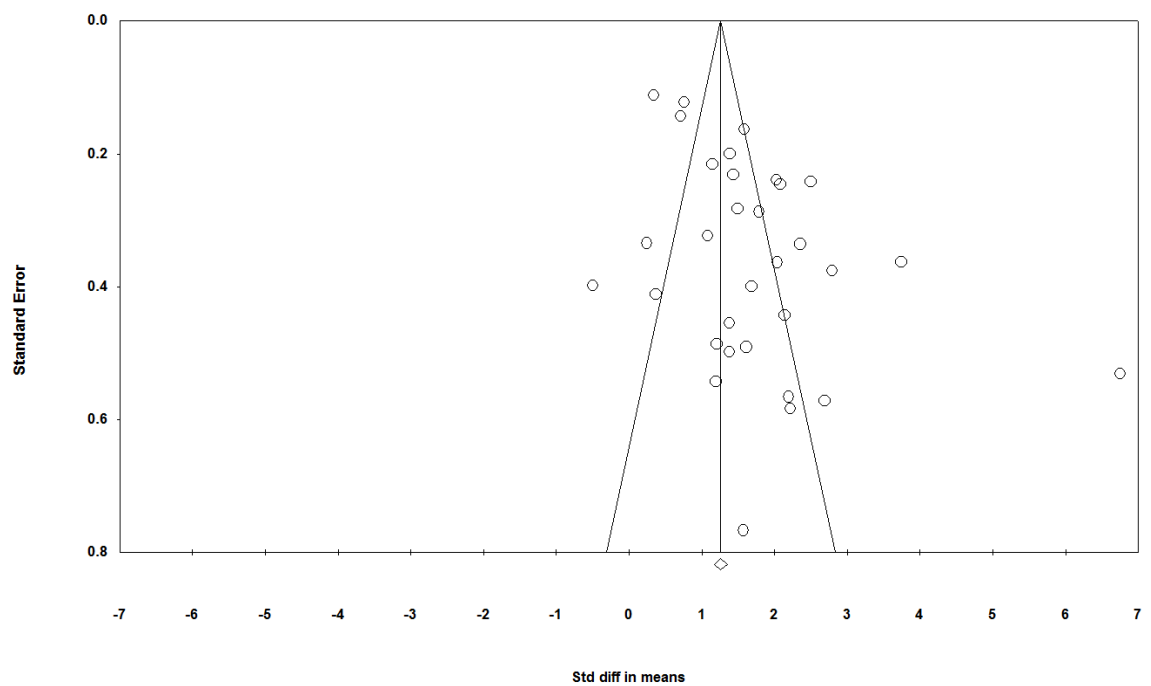

Figure 4: Funnel Plot Evaluating Publication Bias

Summary

This chapter outlines the statistical analyses and results for this meta-analytic study. A summary of the overall treatment effects by treatment protocol is shown below.
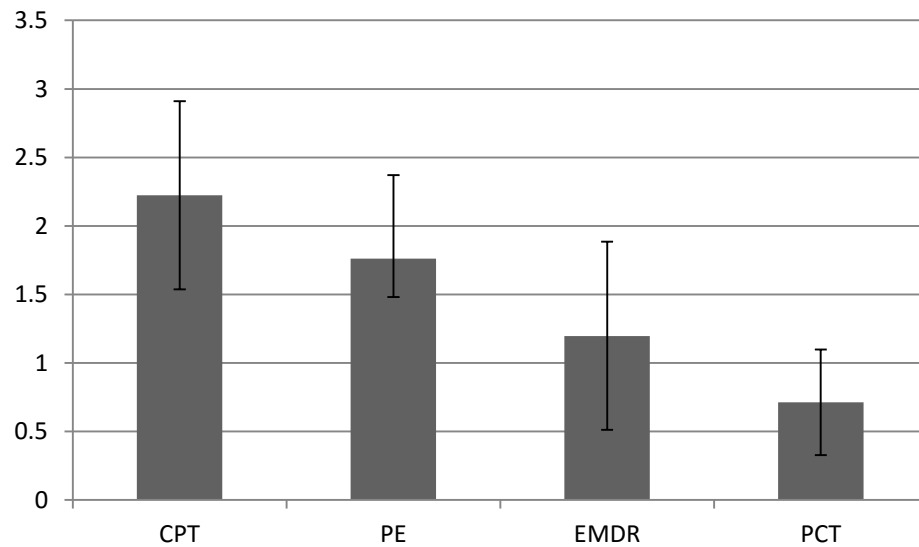
Figure 5: Treatment Effects by Treatment with 95% Confidence Interval

As shown, results indicated that CPT appeared to have significantly greater treatment outcomes compared to EMDR and PCT; however, CPT produced similar treatment efficacy as did PE. Of note, while the difference between CPT and PE was not statistically significantly different, the standardized mean differences between the observed treatment effects of these two treatments was .462, which according to the cut offs described by Cohen (1988) would indicate a clinically meaningful difference. Overall, these results would suggest that when looking at only treatment effects, CPT appears to have the greatest impact on reducing PTSD symptoms.

Results further indicated that, where data were available, treatment for PTSD

produced secondary improvements in both anxiety and depression. These secondary improvements did not differ by treatment modality.

With regard to individual factors, civilian patients appeared to have greater responses to EMDR than did veterans, and veterans appeared to have superior improvements when receiving PE or CPT than did civilians. Evaluation of treatment length indicated that CPT protocols tended to be longer than did PE and EMDR.

The following chapter will discuss the implications of these findings in terms of practice and policy. Additionally, limitations of the current study and suggestions for further research will also be discussed.

CHAPTER V

DISCUSSION

The purpose of this research was to conduct a meta-analysis on ESTs for PTSD. The previous chapters have outlined this purpose in more depth, provided a detailed review of treatments, and provided an overview of the statistical findings of this meta-analysis. This chapter will present the conceptual and practical implications of these findings. Additionally, limitations of the current study and recommendations for further research will be discussed.

Summary

Dijkstra, Van der Vleuten, and Schuwirth (2012) described the foundation of clinical decision-making as being the integration of research with clinical judgment. Specific to research, Dijkstra et al. (2012) further note that the goals of clinical research are to answer the following questions: (a) What works best?; (b) Who does it work for?; and (c) Under what conditions does it work best? This meta-analysis aimed to answer these three questions in order to provide clinicians with further empirical support to drive clinical decision-making with regard to PTSD treatment.

With regard to what treatment works best, results of this meta-analysis suggest that CPT appears to be associated with the greatest amount of PTSD symptom reduction following treatment. However, effects of CPT did not significantly differ from outcomes following PE, but CPT had significantly greater reduction of symptoms compared to all

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other treatments evaluated, including EMDR and PCT. As expected, all treatments

evaluated were associated with significant reductions in PTSD symptoms following a

course of treatment. These findings are consistent with prior research, in that exposure

continues to have a favorable impact on treatment (Rauch, Eftekhari, Ruzek, 2012). The

use of exposure as a treatment for PTSD is founded on the biological response of trauma

and an overgeneralization of responses to triggers of the trauma (Foa et al., 2007). While

each respective treatment describes the utility and foundation of the use of exposure from

a slightly different lense, the physiological responses to exposure appear to be effective

regardless.

       With regard to whom particular treatments work best for, this study was limited in

its ability to make comparisons across individual factors such as gender, trauma type, and

other demographic variables. In some cases, only aggregate data was available from

primary sources, which resulted in an inability to parcel out study outcomes to make

further group comparisons. Furthermore, initial evaluation of the data revealed

significant associations between individual factors that were extracted from studies,

including gender, index trauma, and population. These associations, while significant,

were not unexpected. Prior research has well documented a link between gender, trauma

type, and trauma severity (Brewin et al., 2000; Taft, Watkins, Stafford, Street, &

Monson, 2011). There is also a well-documented gender imbalance among both active

duty and veteran individuals, with there being a disproportionate number of males.

       Despite these limitations, however, this study was able to make comparisons for

efficacy across treatments by population, which in this case was defined as civilian vs.

veteran populations. Results from these findings suggested that civilian patients appeared to have a more favorable response to EMDR when compared to veterans also receiving EMDR. Because of the extensive overlap between gender and type of trauma, it is difficult, if not impossible, to truly parcel out differential treatment outcomes on the basis of one factor. That being said, individuals in this group were disproportionately female and tended to report physical and sexual abuse as the index trauma. Shapiro (1995) has indicated that the reprocessing stage of EMDR may be particularly useful in reducing the symptoms of PTSD in cases of complex and/or recurrent trauma, which may partially account for the civilian individuals having a greater response to this treatment. One plausible explaination for this could be differnces in the symptomatic expression of PTSD in the wake of IPV. Sepecifically, realistic and adaptive safety behaviors, such as hiding money, being aware of one's surroundings, may be adaptive and protective.

Conversely, veterans appeared to have a greater response to CPT and PE compared to civilians. Veterans compared to civilians are more likely to report combat as their index trauma (Brewin et al., 2000). However, there has been increased attention on acts of military sexual trauma (Hyun, Pavao, & Kimerling, 2009). Building on this, one possible explanation for these findings is that the trauma associated with combat may be more easily identifiable than the complex trauma associated with interpersonal violence or more sustained periods of trauma. It may also be that the negative cognitions and behaviors associated with combat trauma may be more easily challenged than those associated with abuse or sexual assault. For example, many of the safety behaviors that are adaptive in a combat zone, such as patrolling perimeters, can be more easily

determined to be maladaptive or unnecessary in a civilian situation. Conversely, many safety behaviors associated with abuse-related trauma, such as checking locks and surroundings, may continue to serve as adaptive or protective, especially in cases of stalking or when the perpetrator of the violence has access to the victim. Put another way, there are certain situations following abuse in which acting on hypervigilance may be adaptive, whereas acting on hypervigilance following combat will rarely have an adaptive value. Challenging these thoughts and behaviors are central to treatment for both PE and CPT, which may account for the differences in treatment response between veteran and civilian populations. These differences in outcomes by population come with the caveat that there continues to be a strong association between gender, index trauma, and population as defined in the current context. Further research will be needed to parcel out differential outcomes by these factors.

The last question posed by Dijkstra et al. (2012) was what conditions treatment works under. Available data from the current meta-analysis were inconclusive in determining which conditions appear to be best. The main variable of interest related to treatment conditions examined as a part of this study was length of treatment. As mentioned in previous chapters, there were significant differences in the length of treatment across intervention, which resulted in dependence between treatment type and length of intervention. On average, treatment protocols using EMDR were significantly shorter compared to CPT, PE, and PCT. As such, the current analyses could not fully examine the dose response across each treatment. In order to fully examine the dose response to each treatment, further individual sample studies will be needed.

Additionally, in terms of the treatment conditions, the present study did find that both CPT and EMDR were associated with significant decreases in anxiety and depression. These findings suggest that treatment for PTSD also appears to address some of the co-morbidities often seen with PTSD, specifically including depression and anxiety. Of note, however, this study could not parcel out depressive and anxiety symptoms that may come secondary to PTSD from potentially pre-existing anxiety and depressive symptoms, which may respond to treatment differently. The secondary impact of PTSD treatments on other mental health symptoms, specifically anxiety and drepression, is also consistent with prior research. It has been well documented that mental health symptoms often co-exist and interact, especially in the wake of traumatic experiences (McFarlane et al., 2012). Furthermore, these results are consistent with the theoretical underpinnings of most approaches examined, specifically looking PE (Foa et al., 2007), CPT (Resick & Schnicke, 1996), and EMDR (Shapiro, 2001), are heavily rooted in the congnitive-behavioral tradition. From these perspectives, interventions aimed at addressing ineffective cognitions and behaviors are strongly associated with decreases in depression and anxiety (Beck, 2011).

Implications

The results of this study have practical implications for practice, policy, and training. With regard to practice, these results would suggest that in its most general sense, CPT appears to have the greatest treatment effect on reducing PTSD symtpoms, followed closely by PE. With regard to treatment planning, this may suggest that CPT may be a valueable first-choice treatment when working with a individuals with PTSD.

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However, strong evidence of efficacy is not a gaurentee of treatment success. As such, clinical decision making and treatment planning should continue to be an evolving process driven by both clinical experience and empirical knowledge. Put another way, just because CPT appears to have the greatest treatment effect, does not mean that CPT will be the best treatment approach for everyone. Individual characteristics, preference, and response to treatment should continue to be driving factors in treatment planning.

In terms of training implications, these results might suggest that psychology trainees will likely benefit from formal training on cognitive-behavioral approaches to treating PTSD, specifically on CPT and PE. This study has found that, in general, treatments that include exposure, a historically behavioral strategy, appears to have a greater effect than treatments without exposures. From this, it is recommended that psychologists-in-training be exposed to these types of interverention. Furthermore, students in the field of clinical and counseling psychology may benefit from exposure to and practice with manualized treatments as well as applying manualized treatment in a flexible manner while maintaining treatment fidelity.

The results of this meta-analysis continue to support the efficacy of therapy on reducing PTSD symptomatology. It has been well-documented prior research that mental health concerns, especially with regard to exposure to traumatic experiences, is associated with a variety of adverse health indicators (Dolezal, McCollum, & Callahan, 2009). Building on this, the results of this study may suggest that mental health treatment can improve not only the quality of life, but also improved mental health may serve as a buffer or protective factor against adverse health outcomes. In terms of policy, the

findings of this study support the importance of access to mental health treatment. Additionally, it may be that the cost of reimbursement for psychological treatment may actually reduce the cost associated with adverse health outcomes, which may suggest that mental health treatment may be considered a preventative health care service, which in trun would provide further coverage from third party payers.

Limitations and Directions for Future Research

As is the case with all research, this study has limitations. Specifically, this study was limited in its ability to examine the impacts of treatment factors and individual factors on treatment outcomes. In order to address these limitations, further researcher is recommended to compare the outcomes of various treatments across varying individual factors and treatment settings. For example, large sample, randomized control trials evaluating the differential outcomes by key demographic and treatment factors may be more adept at examining these types of research questions than a meta-analytic approach.

Another limitation of this study is that although meta-analyses are robust analytic procedures, the findings of this type of approach should still be interpreted within the context that they have been derived (LeLorier, Gregoire, Benhaddad, Lapierre, & Derderian, 1997). In other words, a meta-analysis is only as robust as the weakest study included. While efforts were made to include only strong studies, as set by inclusion criteria of peer-reviewed articles, there are often many unknown details which may impact the findings of individual studies that go unmentioned. To address this limitation, it is recommended that both meta-analysis and large sample, randomized control trials be used in collaboration to inform best practice.

Although meta-analysis is a strong analytic procedure for making generalizations, meta-analysis is not robust at parceling out individual treatment factors. Each of the treatments evaluated in this study have some overlap in treatment interventions as well as unique contributions to treatment.

Further research, such as component analyses, may be needed to further examine which specific interventions or aspects of treatment are most effective in reducing symptoms of PTSD. This further research may be utilized to create a common factors, integrated approach to PTSD treatment.

Additional single-sample research may also be needed to examine the direct comparisons of treatment efficacy across individual levels. One such example of this might include looking at the treatment efficacy in veterans as there continues to be an increase in women in the armed forces. Specifically, research may be needed to examine whether women veterans respond similarly to male veterans when using CPT or PE. Similarly, examination of the efficacy of EMDR by gender may also be needed.

Lastly, although this study does provide evidence to support the use of all the interventions that were examined, with a particular emphasis on CPT and PE, implementation of these treatments should not be based on these factors alone. The results of this study should be used as part of the clinical decision-making process, but treatment planning and recommendation should also take into account individual and contextual factors, such as gender, index trauma, and other sociocultural factors.

Conclusions

Results from this study not only present a greater understanding of the efficacy of

PTSD treatments, but also provide a new framework for examining treatment efficacy within the field of applied psychology. As a discipline in the healthcare field, psychology has continually had to defend and prove the efficacy of its work. Historically, this has resulted in single-sample studies and research camps that may be allegiant to a particular approach or theory. This study would suggest that we need to look beyond alliegence and simple group comparisons, but look beyond this into comparing efficacy across treatments. Clinical decision making should be driven by best available evidence and clinical experiences as opposed to the historical tradition of theoretical alligence. Clinical practice, training, and research can continue to be refined to better provide care based on this model.

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APPENDIX A

IRB Waiver

TO:	DR. LARRY LEFLORE, DEAN OF THE GRADUATE SCHOOL
	DR. RUTH JOHNSON, ASSOCIATE DEAN OF THE GRADUATE SCHOOL
	DR. JEFF HARRIS, DISSERTATION CHAIR FOR JOHN MADDOUX
FROM:	DR. RHONDA R. BUCKLEY, IRB CHAIR
SUBJECT:	JOHN MADDOUX DISSERTATION: NO NEED FOR IRB APPLICATION OR APPROVAL
DATE:	9/9/2014

John Maddoux is completing a meta-analysis of currently published research articles for his dissertation. In doing so, he will not be using human subjects for data collection, therefore, he is not required to complete an IRB application or receive IRB approval before conducting his study. If you have any questions about this, please feel free to contact me.

Thank you for your time.

Rhonda R. Buckley, Ph.D.
Phone: 940-898-3152
RBuckley@twu.edu

APPENDIX B

Summary of Extracted Data

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Alvarez et al. (2011)	CPT	PCL	64.05	11.14	104	55.5	12.78	104		V	M
Basharpoor et al. (2011)	CPT	PCI	116.25	29.89	16	58.18	24.1	16		C	
Chard (2005)	CPT	CAPS	65.46	26.39	28	9	11.04	28		V	
Chard (2005)	CPT	BDI	24.43	10.81	28	6.47	6.77	28		V	
Chard (2005)	CPT	PSS	57.57	22.85	28	7.54	9.51	28		V	
Chard et al. (2010) - OEF/OIF	CPT	CAPS	17.88	16.41	51	31.5	21.97	51		V	
Chard et al. (2010) - OEF/OIF	CPT	PCL	59.31	10.24	51	38.33	18.49	51		V	
Chard et al. (2010) - OEF/OIF	CPT	BDI	29.29	12.69	51	16.71	13.4	51		V	
Chard et al. (2010) - Vietnam	CPT	CAPS	66.48	16.58	50	42.5	24.51	50		V	
Chard et al. (2010) - Vietnam	CPT	PCL	60.1	11.03	50	48.64	18.9	50		V	

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Chard et al. (2010) - Vietnam	CPT	BDI	29.65	9.57	50	21.64	13.74	50		V	
Suris et al. (2013)	CPT	CAPS	85.07	2.69	50	64.97	3.27	45	MST	V	
Suris et al. (2013)	PCT	CAPS	83.81	3.29	46	68.64	3.61	44	MST	V	
Suris et al. (2013)	CPT	PCL	65.53	1.67	50	51.39	2.02	45	MST	V	
Suris et al. (2013)	PCT	PCL	65.4	2	46	57.89	2.18	44	MST	V	
Suris et al. (2013)	CPT	QIDS (Dep)	15.85	0.62	50	12.84	0.75	45	MST	V	
Suris et al. (2013)	PCT	QIDS (Dep)	15.82	0.76	46	13.82	0.83	44	MST	V	
Galovski et al. (2012)	CPT	CAPS	74.45	16.59	47	26.96	3.88	37	IPV	V	
Galovski et al. (2012)	CPT	BDI	30.06	10.49	47	9.67	2.06	37	IPV	V	
Jeffreys et al. (2014)	CPT	PCL	64.45	12.72	20	32.43	8.87	7		V	
Monson et al. (2006)	CPT	CAPS	76.73	14.24	30	52.14	3.9	30		V	

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Monson et al. (2006)	CPT	PCL	60.66	8.21	30	49.58	2.1	30		V	
Monson et al. (2006)	CPT	BDI	25.39	9.99	30	20.15	1.6	30		V	
Resick et al. (1992)	CPT	SCL-90 (PTSD)	1.56	3.56	18	0.93	0.51	18	Sexual Assault	C	F
Resick et al. (1992)	CPT	SCL-90 (Dep)	2.15	3.73	18	1.39	0.77	18	Sexual Assault	C	F
Resick et al. (2002)	CPT	CAPS	74.76	18.77	62	39.08	31.12	62	Sexual Assault	C	F
Resick et al. (2002)	CPT	BDI	23.7	10.39	61	12.73	11.17	61	Sexual Assault	C	F
Resick et al. (2002)	CPT	PSS	29.55	8.62	62	13.66	11.05	62	Sexual Assault	C	F
Resick et al. (2002)	PE	CAPS	76.6	19.72	62	44.89	33.52	62	Sexual Assault	C	F
Resick et al. (2002)	PE	BDI	24.03	8.88	61	16	11.06	61	Sexual Assault	C	F

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Resick et al. (2002)	PE	PSS	30.09	9.18	62	17.99	13.17	62	Sexual Assault	C	F
Resick et al. (2008)	CPT	PDS	29.15	9.54	53	13.98	11.77	42	IPV	C	F
Resick et al. (2008)	CPT	BDI	27.51	11.75	53	14.37	13.83	43	IPV	C	F
Rothbaum et al. (2005)	EMDR	BDI	25.95	7.11	60	10.7	11.45	60	Rape	C	F
Rothbaum et al. (2005)	EMDR	STAI-S	51.1	11.05	60	32.6	11.62	60	Rape	C	F
Rothbaum et al. (2005)	PE	BDI	16.7	8.18	60	4.65	4.99	60	Rape	C	F
Rothbaum et al. (2005)	PE	STAI-S	43.33	12.59	60	30	10.44	60	Rape	C	F
Rothbaum (1997) - Main	EMDR	PSS	33.3	8.7	10	14.3	8.4	9	Rape	C	F
Rothbaum (1997) - Main	EMDR	BDI	21.4	9.6	10	7.3	5.5	10	Rape	C	F
Rothbaum (1997) - Main	EMDR	STAI-S	50.4	10.6	10	31.8	14.7	10	Rape	C	F
Rothbaum (1997) - WLC	EMDR	BDI	34.8	13.8	8	18.7	21.5	7	Rape	C	F
Rothbaum (1997) - WLC	EMDR	STAI-S	63.1	21	8	40.4	23.5	7	Rape	C	F

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Marcus et al. (1997)	EMDR	MPTSD	66.45	20.09	53	24.5	21.3	53		C	
Marcus et al. (1997)	EMDR	BDI	19.26	8.21	53	8.36	8.31	53		C	
Marcus et al. (1997)	EMDR	STAI-S	51.61	10.31	53	38.04	15.15	53		C	
Devilly et al. (1998)	EMDR	Mississippi PTSD	120.42	26.48	12	110.42	27.72	12		V	M
Devilly et al. (1998)	EMDR	BDI	28.77	12.03	13	21.23	15.47	13		V	M
Devilly et al. (1999)	EMDR	BDI	28.18	14.25	11	18	15.74	11			
Devilly et al. (1999)	EMDR	PSS	35.09	11.35	11	14.42	14.13	11			
Carlson et al. (1998)	EMDR	Mississippi PTSD	117.5	14.3	10	92.8	20.8	10	Combat	V	M
Carlson et al. (1998)	EMDR	STAI-S	47.2	9.4	10	34.9	9	10	Combat	V	M
Carlson et al. (1998)	EMDR	BDI	20.1	7.5	10	6.9	5.9	10	Combat	V	M
Vaughan et al. (1994)	EMDR	SI-PTSD	27.9	9.5	12	16.8	6.2	12			

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Vaughan et al. (1994)	EMDR	HRSD (Dep)	13	5.3	12	6.3	3.8	12			
Jensen (1994)	EMDR	SI-PTSD	29.92	11.14	13	35.69	12	13	Combat	V	M
Forbes et al. (1994)	EMDR	SI-PTSD	38	4.89	8	25.25	14.25	8			
Forbes et al. (1994)	EMDR	BDI	19.5	11.9	8	13.37	9.16	8			
Foa et al. (1999)	PE	PSS	29.48	9.94	23	11.7	7.32	23			
Foa et al. (1999)	SIT	PSS	29.42	8.69	19	12.89	8.96	19			
Foa et al. (1999)	PE	BDI	17.58	11.29	23	5.7	4.77	23			
Foa et al. (1999)	SIT	BDI	21.73	11.02	19	10.05	8.06	19			
Foa et al. (1999)	PE	STAI-S	49.95	13.7	23	32.43	10.93	23			
Foa et al. (1999)	SIT	STAI-S	51.5	13.37	19	39.07	11.5	19			
Foa et al. (1991)	PE	PTSD	25.78	5.01	10	15.4	11.09	10	Rape		F
Foa et al. (1991)	SIT	PTSD	24.48	6.62	14	11.07	3.97	14	Rape		F

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Foa et al. (1991)	PE	BDI	19.6	9.41	10	13.4	14.22	10	Rape		F
Foa et al. (1991)	SIT	BDI	19.43	10.99	14	9.86	6.76	14	Rape		F
Foa et al. (1991)	PE	STAI-S	58.1	11.72	10	41.5	13.77	10	Rape		F
Foa et al. (1991)	SIT	STAI-S	54.39	6.9	14	37.15	7.58	14	Rape		F
Schnurr et al. (2003)	PCT	CAPS	82.01	18.38	163	76.03	16.85	163			
McDonagh et al. (2005)	PCT	CAPS	67.7	14.6	22	47.2	22.4	22			
Schnurr et al. (2007)	PCT	CAPS	77.9	16.47	143	60.1	28.68	143			
Schnurr et al. (2007)	PE	CAPS	77.6	18.18	141	52.9	30.9	141			
Ready et al. (2010)	PCT	CAPS	101	9.51	5	75.5	22.2	4		V	M
Ready et al. (2010)	PCT	BDI	30	7.78	5	27	4.97	4		V	M
Foa et al. (2005) - CTSA	PE	PDS	35.1	5.7	47	19	14.8	47	Assault	C	F
Foa et al. (2005) - CTSA	PE	BDI	26.1	10.8	47	16.2	13.4	47	Assault	C	F

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Foa et al. (2005) - WOAR	PE	PDS	32.3	5.8	32	16.2	14.1	32	Assault	C	F
Foa et al. (2005) - WOAR	PE	BDI	26.1	9.7	32	12.4	14.1	32	Assault	C	F
Hagenaars et al. (2010)	PE	CAPS	73.54	20.11	99	32.97	30.21	99		C	
Rauch et al. (2009)	PE	PDS	36.2	8.1	10	17.2	9.2	10		V	
Rauch et al. (2009)	PE	BDI	24.6	9.9	8	13	8.4	7		V	
Yoder et al. (2012) - OEF/OIF/OND	PE	PCL	62.13	10.41	61	33.31	12.54	61		V	
Yoder et al. (2012) - OEF/OIF/OND	PE	BDI	28.42	9.8	61	15.73	10.62	61		V	
Yoder et al. (2012) - Vietnam	PE	PCL	64.44	10.95	34	39.63	16.24	34		V	
Yoder et al. (2012) - Vietnam	PE	BDI	30.63	16.24	34	15	9.54	34		V	

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.

Study	Int.	Meas.	Pretest			Posttest			Index Trauma	Pop.	Gen.
			M	*SD*	*N*	*M*	*SD*	*N*			
Yoder et al. (2012) - Gulf War	PE	PCL	66.53	6.06	17	47.94	14.36	17		V	
Yoder et al. (2012) - Gulf War	PE	BDI	29.93	10.1	17	18.71	10.04	17		V	

Note. Int. = Intervention; Meas. = Measure; Pop. = Population; C = Civilian; V = Veteran; Gen. = Gender; M = Male; F = Female.