Traveling the Road to Healing:
An Examination of the Relationship between Psychotherapeutic Technique and Cognitive, Emotional and Physiological Outcomes in Women Exposed to Violence

by

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Voices of Study Participants

I used to not like being big-boned. But when I think about all this stuff that's happened, and I look at you, I think, "I'm glad I was big. If I were your size I'd be dead by now."

-D., age 56

I could feel the ability to stay in the present and control my feelings flit above my head like a bird, who evaporated as soon as I tried to grab it. That's how it's always been.

-K., age 50

Last time, when I was here, I remember I kept talking about who I could have been if they hadn't taken it away from me. And now, I realize that who I am is just fine.

-D., age 47

For my women: Angie, Caroline, Cathy, Erin, Jenni, Julie, Marie, Marilou, Sarah and Shari

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me to hone my own gifts, and I can only hope to follow in his footsteps. It is through watching him live that I have learned the meaning of integrity.

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Abstract

Contemporary research on therapy for trauma survivors has favored the approach of manipulating therapy interventions with highly structured protocols, rather than measuring therapy as it naturally occurs. Thus, we know much about treatments for trauma-related symptoms that are rarely practiced. We know much less about the real world effectiveness of the treatments that are most commonly practiced. Moreover, both randomized trials and naturalistic studies have been criticized for over-reliance on self-report. Laboratory-based, objective assessments have demonstrated that interpersonal violence survivors have alterations in cognition and physiological arousal that correlate with their psychopathology. This study examined the relationship between psychotherapy processes and changes in both self-reported symptoms and laboratory measures in 27 female interpersonal violence survivors who received 3 months of therapy in the community. Therapists treated patients using their normal practices and no effort was made to get therapists to adhere to a structured protocol. Participants were assessed in the lab and completed self-report measures before and after three months of therapy. Attentional biases for trauma-related material were assessed using the Stroop task. Implicit memory for trauma-related material was assessed using a Word-Stem Completion Task. Physiological arousal was assessed while participants viewed trauma-related slides. Therapists used a modified version of the Psychotherapy Process Q-Set (PQS) to quantify their choice of psychotherapy techniques. The PQS ratings were

reduced to well-established scales reflecting general psychodynamic and cognitive-behavioral therapeutic techniques and newly derived scales assessing trauma-focused work on shame, guilt and meaning; stress inoculation (SIT); and prolonged exposure (PE). Improvements in self-reported symptoms, attentional biases, and physiological arousal were related to greater presence of techniques associated with psychodynamic therapy; trauma-related work on shame, guilt and meaning; and SIT, but not with techniques associated with PE therapy. Contrary to prior research, working alliance was not related to symptom improvements. These findings suggest that psychodynamic techniques; work on guilt, shame and meaning; and SIT techniques can play a role in both symptom alleviation and improvements in cognition and physiology in significantly traumatized women. These results are limited by the correlational nature of the data and the unknown validity of some of the newly derived therapy process measures.

Chapter I

Introduction

The visceral and overwhelming horror we often feel when we hear stories of sexual violence and domestic abuse is but a small taste of the incapacitating suffering felt by those who experience such assaults firsthand. One group that experiences particularly grievous distress is survivors of interpersonal violence (IPV), in particular victims of stranger and family physical and sexual abuse. IPV is more likely than other trauma types, such as accidents and large-scale disasters, to lead to chronic, negative outcomes (Breslau et al., 1988; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). IPV survivors report symptoms such as an inability to get the trauma out of their heads, wrenching nightmares, fear of intimacy, disrupted relationships, depression, personality changes and instability, constant vigilance, emotional numbing, self-loathing, and a loss of joy and pleasure in life (American Psychiatric Association, 2000; Battle et al., 2004, Breslau, 2001; Herman, 1992, van der Kolk, 2005). It seems as if all facets of functioning can be disrupted in the face of interpersonal violence: emotional, cognitive, physiological, and relational functioning are hijacked. The result is that traumatic events often become the focal point of the IPV survivor's life. Despite the obvious suffering of IPV victims, little empirical data has been amassed for how to best help them.

Researchers and practitioners have attempted to address the needs of trauma survivors through knowledge gleaned from the empirically-supported treatment (EST)

movement. Therapies such as prolonged exposure (Foa, Rothbaum, Riggs, & Murdock 1991), cognitive processing therapy (e.g.,Resick & Schnicke, 1992), brief dynamic therapy (Horowitz, 1976), Stress Inoculation Training (Veronen, Kilpatrick, & Resick, 1978 and dialectical behavioral therapy (Linehan, Tutek, Heard, & Armstrong, 1994) have been devised and tested for trauma-related syndromes such as Posttraumatic Stress Disorder (PTSD), Major Depressive Disorder (MDD), and Borderline Personality Disorder (BPD). Findings have been promising, with recovery rates ranging from 40% to 80% (Bradley, Green, Russ, Dutra & Westen, 2005; Robins & Chapman, 2004). However, the long-term effects of therapy have been more modest with some groups. A recent meta-analysis found that only 32% of people with PTSD maintain a level of clinically-significant improvement six months post-therapy (Bradley et al., 2005). The high relapse rates may be related to shortcomings of the implementation of treatments in the randomized clinical trials (RCT) that comprise a large proportion of the published literature. Though RCT designs have many benefits including the ability to show that specific treatments are responsible for observed changes (Chambless & Hollon, 1998; Chamless, 1996), one of the most notable flaws in these designs is their questionable generalizability (Seligman, 1995). RCT designs rarely study therapy as it is actually practiced in the community but rather pre-defines the treatments to a circumscribed set of therapy techniques. Thus, we know little about whether real-world therapies would achieve better or different results (Thompson-Brenner & Westen, 2004; Westen, Novotny & Thompson-Brenner, 2004). Furthermore, participants in RCTs often differ from the populations that present in community and private practice settings. For example, whereas RCT patients typically meet criteria for only one or a few DSM disorders, many

real-world patients either meet criteria for no DSM disorders or multiple DSM disorders (Thompson-Brenner & Westen, 2004; Westen, Novotny, & Thompson-Brenner, 2004). The potentially low generalizability of RCT designs, paired with the high relapse rate of trauma-related syndromes following treatment in RCT studies, warrants a closer look at the effectiveness of therapy for trauma survivors in the community. Furthermore, in order to understand how to improve quality of care for IPV survivors, it may be beneficial to examine more objective means of assessing outcomes (e.g., Foa, Rothbaum, Riggs, & Murdock, 2002; Resick & Schnicke, 1992). Most treatment studies have relied upon self-report measures, which may be subject to demand characteristics and social desirability response bias. In order to provide a basis for understanding the effectiveness of trauma-focused therapy and how one might assess outcomes, I will review and discuss 1) treatment approaches for IPV-related difficulties and the data that supports therapeutic approaches; 2) data amassed on the topic of broad and objective assessment of traumatic stress sequelae and post-therapy outcomes and 3) how trauma theory, assessment and treatment can be brought together to form a more detailed and cohesive view of what we know about psychological effects of IPV and how to treat them.

Therapy in the aftermath of interpersonal violence

Therapeutic interventions for interpersonal violence victims are as broad and diverse as the spectrum of post-trauma reactions. Goals for intervention include improving relationships and restoring trust (Foa & Street, 2001; Robertson, Rushton, Bartrum, & Ray, 2004); working with cognitive schemas, particularly those involving safety and shame (Brown, 2004; Resick & Schnicke, 1992); integrating and reprocessing

the traumatic memory (Davidson, 2001; Foa & Meadows, 1997; Horowitz, 1976); improving emotion regulation skills (Levitt & Cloitre, 2005; Shearin & Linehan, 1994); augmenting coping skills (Veronen, Kilpatrick, & Resick, 1978); facilitating physiological habituation to trauma reminders (Nishith, Resick, & Griffin, 2002); fostering empowerment (Brown, 2004); providing an opportunity for meaning-making of the traumatic events (Horowitz, 1976; Krupnick, 2002); and bringing unconscious assumptions and emotions into conscious awareness (Krupnick, 2002). Different "brand name" therapies tend to emphasize targets for intervention based upon their accompanying theory of post-trauma psychopathology. Yet, many show overlap in their selection of techniques.

Several of these therapeutic approaches have been the subject of effectiveness and efficacy research for post-trauma syndromes. Generally speaking, the empirical literature on trauma-focused therapy to date has utilized diagnosis-specific interventions that heavily focus on the treatment of PTSD (e.g., Foa, Rothbaum, & Riggs, 1991; Resick & Schnicke, 1992). However, treatments have also been explored for trauma-related syndromes such as MDD (Talbot et al., 2005), and BPD (Linehan, 1993) following traumatic events. Prolonged exposure (Foa, et al., 1991), cognitive reprocessing therapy (Chard, 2005; Resick and Schnicke, 1992), eye movement desensitization and reprocessing (EMDR; Shapiro, 1989), psychodynamic therapy (Horowitz, 1976; Krupnick, 2002), feminist therapy (Brown, 2004), dialectical behavioral therapy (Linehan, 1993), interpersonal psychotherapy (Klerman, Weissman, Rousanville, & Chevron, 1984), and stress inoculation training (Veronen, Kilpatrick, & Resick, 1978) have all shown promising outcomes. Representative studies will be described herein.

Both within the trauma literature and in the broader psychotherapy world, therapy brands can broadly be divided into two camps: those focused on managing emotions, and those focused on expressing emotions (Clemence, Hilsenroth, Ackerman, Strassle, & Handler, 2005; Jones & Pulos, 1993). Broadly speaking, emotion-management therapies are based on the belief that "out of control" emotions are the cause of psychopathology and distress. In contrast, emotion-expression therapies are based on the belief that suppression and over-control of emotions causes problematic emotions to worsen (Jones & Pulos, 1993). This theoretical divergence is mirrored in therapy technique. Emotion-management therapies include prolonged exposure, cognitive processing therapy, stress-inoculation training, and dialectical behavior therapy (described in detail below), while emotion-expression therapies include supportive therapy, interpersonal therapy, and psychodynamic or psychoanalytic therapies. In this scheme, therapies that mix expressive and management techniques are called eclectic.

Emotion-Management Therapies: Cognitive-Behavioral Treatments

For the most part, cognitive behavioral treatments for trauma involve elements of a) cognitive restructuring, which address cognitive distortions about safety and responsibility; and b) exposure to traumatic content, which enhance emotional processing and ameliorate avoidance/numbing and hyperarousal symptoms. It is common for cognitive and behavioral elements to be combined in the treatment of trauma.

Prolonged Exposure (PE). One of the most empirically tested of the trauma therapies is Foa et al.'s (1991) prolonged exposure therapy (Bradley et al., 2005; Sherman, 1998). The main goal of PE is to provide an opportunity for physiological

habituation to traumatic memories. *Physiological habituation* occurs through repeated exposure to trauma cues which results in decreased physiological responsivity over time. However, attentional biases for traumatic material may maintain physiological hyperarousal. Thus, a goal of treatment for trauma survivors is aiding them in processing information to inhibit preferential attention to trauma-relevant stimuli. Other goals include reduction of avoidance/numbing symptoms, integration of traumatic memories, and increasing feelings of efficacy as a result of confronting one's fears. To accomplish these goals, both imaginal and in vivo exposure are employed. In imaginal exposure, clients repeat and elaborate the story of their trauma (i.e., the narrative) in session until they no longer feel anxiety when thinking about the event (Foa et al., 1991). In vivo exposure assignments direct clients to put themselves in the actual presence of trauma-relevant stimuli. For example, clients are encouraged to visit the location of an attack. A key tenet of exposure therapy is that it occurs for a duration that allows for habituation, and that the removal of the aversive stimulus does not occur until arousal and distress have abated. Sessions are often conducted twice weekly for an hour and a half at a time and treatment often spans approximately 8-12 sessions.

Recent meta-analyses provide valuable data about the efficacy of PE. The most current meta-analysis (Bradley et al., 2005) found that when averaging across 13 studies, PE had a large effect size (Cohen's $d = .84$) when compared with supportive control therapies. Effect sizes were larger when PE outcome was compared to pre-treatment symptom levels and the outcomes of waitlist controls. Furthermore, this meta-analysis found that 41.5% of patients who entered treatment initially (including clients who terminated prematurely) were classified as experiencing "clinically significant

improvement" (e.g., a change in PTSD symptom scale scores of greater than two standard deviations) immediately following treatment. Few studies have reported follow-up data but it appears as though the pre-treatment to follow-up recovery rate is approximately 32%. It is of note that the outcome measures utilized by the studies included in this meta-analysis relied exclusively on subjective symptom measures. Outcomes were not determined utilizing laboratory-based or observational data. Another important point to note is that clients and therapists alike often report discomfort with the idea of enduring the distress required by PE and therefore give serious consideration to alternative treatments (e.g., Kilpatrick & Best, 1984; Solomon & Johnson, 2002).

Cognitive Restructuring. Cognitive restructuring confronts schemas and dysfunctional cognitions not addressed by exposure-based therapies. Resick and Schnicke (1992) note that survivors of interpersonal violence are commonly afflicted with cognitive distortions such as blaming themselves for the traumatic event, globally evaluating situations as unsafe, harboring beliefs that interfere with intimacy and trust, and thoughts of shame or contamination by the traumatic event. Cognitive distortions are addressed through evaluations of target thoughts. For example, survivors are helped to evaluate whether their beliefs about safety are merited in all conditions. Adjunct cognitive techniques teach "thought stopping" to combat rumination and guided self-dialogue to counteract destructive thoughts. Cognitive restructuring is conducted in both groups and in individual settings and typically spans 8 to 12 weeks. Several research groups have developed similar cognitive techniques to address post-trauma cognitive changes, including Foa and Rothbaum's (1998) cognitive behavior therapy (CBT) for PTSD.

Resick and Schnicke (1992) investigated the outcomes of a group format of cognitive processing therapy (which draws upon cognitive restructuring) in 19 women who had experienced rape. At the outset of treatment, 17 of the women met criteria for PTSD and 12 met criteria for MDD as determined by SCID interviews. Following treatment, none of the women met full criteria for PTSD, and seven no longer met full criteria for MDD. The authors further investigated whether symptom improvement was clinically significant as indexed by the *Symptom Checklist-90-Revised,* a widely-used self-report measure of psychiatric symptoms. At the outset of treatment, 61% of participants had SCL-90-R PTSD subscale scores that were two standard deviations above the non-clinical norm. By termination, only 16% had self-reported symptoms in the clinically distressed range. These gains were largely maintained at the six-month follow-up.

Chard (2005) has modified Resick and Schnicke's CPT for adult rape survivors to better accommodate the needs of childhood sexual abuse survivors. This adaptation includes an emphasis on how current life events confirm unhealthy schemas formed by the abuse, as well as a combination of group and individual sessions that span 17 weeks. The author found that PTSD and MDD symptoms (reported by the CAPS and PSS, and Beck Depression Inventory, respectively) were almost completely eliminated at post-treatment. In addition, dissociative experiences had all but completely vanished. Furthermore, symptoms were still below clinical levels at a one-year follow-up.

Stress-Inoculation Training (SIT). Muscle relaxation, breathing retraining, guided self-dialogue, and communication skills are all key components of SIT (Meichenbaum, 1973). Many incarnations of this treatment are used, but the formula of SIT developed

by Kilpatrick et al. (1979) is perhaps the most widely tested and used variety (Solomon & Johnson, 2002). This particular form of SIT was adapted from Meichenbaum's (1974) version of SIT to more appropriately meet the needs of sexual assault survivors. It has been adapted to include psychoeducation and cognitive reframing. The basic rationale of SIT is that increasing a client's daily life coping skills will reduce their susceptibility to becoming overwhelmed by trauma-related stressors. SIT teaches progressive muscle relaxation, meditation, assertiveness, visualization exercises, coping self-talk and identification of stress triggers, and clients are encouraged to complete homework assignments as practice for the skills they are learning in therapy. SIT can be used as a stand-alone treatment of approximately 12 sessions, but is often combined with other treatments to help abate symptoms and provide a base of coping techniques as a buffer against stress or negative emotions that may arise in the course of therapy (Solomon & Johnson, 2002).

Foa et al. (1991) compared the efficacy of PE, SIT and supportive counseling in 45 female rape survivors with PTSD. Initially, SIT provided greater reductions in symptoms of PTSD and MDD than either PE or supportive counseling. However, at the three-month follow-up, symptoms were lower for women who had been in the PE treatment than for women in the SIT treatment. The authors interpreted these results as suggesting that SIT provides immediate relief, but that the skills women learn from SIT may not be maintained in the long term. This may contrast with PE, which is distressing throughout the treatment, but may provide long-term habituation as a buffer against stress.

Foa et al. (1997) compared the efficacy of SIT alone with prolonged exposure alone and to prolonged exposure plus SIT in 96 female assault survivors. Outcome measures included clinician- and self-report PTSD symptoms, overall life functioning (e.g., work, relationship), and self-report depression symptoms. All treatment conditions evidenced significant improvements across all measures but the effects of prolonged exposure alone were the most robust at the one-year follow-up. However, it is of note that for the purposes of this study, the homework elements of the SIT protocol were eliminated to prevent overlap with prolonged exposure; thus, the efficacy of SIT may have been artificially minimized relative to PE, leading to less robust treatment outcomes in the SIT group. As discussed by Westen, Novonty, and Thompson-Brenner (2005), such choices in randomized clinical trials make the findings from such studies difficult to interpret.

Expressive/Insight-oriented Therapies

Generally speaking, expressive and insight-oriented therapies focus on helping clients express and understand their thoughts and feelings in order to get control over them (Krupnick, 2004; Hilsenroth, et al., 2005). Though insight-oriented therapies, like cognitive therapy, may focus on a person's schemas, the emphasis in insight-oriented therapy is often on understanding conscious and unconscious influences (e.g., thoughts, feelings, motivations) that lead to maladaptive thinking patterns (e.g., Krupnick, 2004). Furthermore, insight-oriented therapies posit that suppression of emotions and thoughts is pathogenic. Thus, expressing and working through feelings and inner conflicts is a central treatment focus in this group of therapies.

Psychodynamic Therapy. Psychodynamic therapy for trauma can take both short-term and long-term forms; however, both forms share a common focus on information "overload" that can occur following traumatic events (Horowitz, 1976). Fostering insight about unconscious thoughts, wishes, or feelings is often a principal component of this therapy. Solomon and Johnson (2002) note that traumatic memories often do not fade over time, but instead become interwoven with all aspects of the survivor's life (including identity, relationships, etc). Furthermore, they explain that the key to successful treatment of trauma requires information processing that addresses both conscious and unconscious representations of the trauma in memory networks. Thus, the goals of therapy include bringing unconscious material into awareness; analyzing the therapist-client relationship as a means of understanding the client's unresolved and latent feelings about important others; re-establishing a sense of meaning, purpose and safety in life; identifying how the client has become caught in a trauma response phase (e.g., becoming overwhelmed by reminders and then withdrawing); and finally, analyzing how threatening thoughts and feelings are kept from awareness (Krupnick, 2002).

Psychodynamic therapies have been criticized for their lack of formal empirical support (Bradley et al., 2005). Despite the fact that psychodynamic therapy is a widely-practiced therapy approach (Westen & Shedler, 1999), there are relatively few well-controlled clinical studies of psychodynamic therapy. However, one reason for the dearth of studies may be that these therapies favor idiosyncratic therapeutic processes and difficult-to-quantify outcomes such as improved ego functioning and greater awareness of internal conflicts instead of self-reported symptom-based outcomes. Difficulties notwithstanding, there are some studies on the efficacy and effectiveness of

psychodynamic therapy in the literature. For example, Brom, Kleber, and Defares (1989) compared brief psychodynamic psychotherapy, exposure, and hypnotherapy to a waitlist control condition. One hundred and twelve participants who had experienced a variety of traumatic events (mainly interpersonal violence and accidents) were randomly assigned to treatment conditions and assessed for PTSD symptoms, state and trait anger, state and trait anxiety, personality, and general distress using self-report measures. They found that while all treatments generally had equal overall effects on PTSD symptomotology, psychodynamic therapy had greater effects on avoidance/numbing symptoms, anger, anxiety, and self-esteem. Though hypnotherapy and exposure therapy had greater effects on intrusion symptoms, these findings indicate that psychodynamic therapy can be effective for treating some types of post-trauma symptoms.

Jones, Cumming, and Horowitz (1988) used a quasi-experimental pre-post design to examine the effectiveness of a 12-session psychodynamic psychotherapy modeled after Horowitz's (1976) post-trauma treatment protocol. Forty women who had experienced bereavement, rape, robbery or other traumatic events showed post-treatment improvements on self- and clinician-reported PTSD symptoms, general distress symptoms, and adjustment to the traumatic event. Treatment gains were largely maintained when the patients were reassessed four-months after therapy. In a more recent exploration of the utility of psychodynamic therapy for a traumatized population, Price et al. (2004) conducted a quasi-experimental pretest-posttest study with 27 women, 12 of whom were adult survivors of childhood sexual abuse (CSA). The group of CSA survivors had multiple comorbid psychiatric diagnoses (e.g., 10 either met criteria for personality disorders or had clinically-significant subthreshold personality disorder

symptoms). Clients participated in a course of short-term psychodynamic psychotherapy that lasted a mean duration of 26 weeks. Clients showed significant improvement with respect to self- and clinician-reported target problems and psychiatric symptoms. Taken together, these studies provide further evidence that brief psychodynamic psychotherapy can be beneficial for traumatized women.

Eclectic Therapies

Dialectical Behavior Therapy (DBT). Linehan's dialectical behavior therapy (1993) is the first and only empirically-supported treatment for borderline personality disorder (BPD). Hailed as the most promising treatment for a deeply challenging client population (Robins & Chapman, 2004), the theory behind DBT states that people with borderline personality disorder have experienced an invalidating environment that disrespects their feelings and their autonomy. In conjunction with environmental influences, people with borderline personalities may be genetically vulnerable to emotional and physiological dysregulation due to dispositional and other factors. The invalidating environment combined with physiological dysregulation leads to chronic parasuicidal behavior, emotion dysregulation, poor coping skills, fears of abandonment, low acceptance of self and others, and poor communication skills (Bohus et al., 2000; Bradley & Follingstad, 2003; Linehan, 1993). Borderline personality disorder has long been associated with chronic childhood victimization (Wagner & Linehan, 1994). DBT addresses these personality-based problems through interrupting behavioral dysregulation, teaching emotion regulation and mindfulness skills, facilitating communication skills, and encouraging self-acceptance. DBT often occurs in a didactic

group setting paired with individual treatment. DBT is highly structured and emphasizes regular therapy attendance and behavioral regulation (e.g., clients are not permitted to take part in self-injurious behaviors in sessions) and often spans a full year or more.

Linehan, Tutek, Heard, and Armstrong's (1994) pioneering study on DBT randomly assigned 26 women with borderline personality disorder to DBT or a treatment-as-usual condition. A history of trauma was not requisite for study participation. Participants in the DBT group had significantly improved anger and interpersonal functioning and decreased suicidal behavior at post-treatment and at a six-month follow-up. In a study explicitly examining the effectiveness of DBT for treating the sequelae of childhood interpersonal violence, Bradley and Follingstad (2003) found that incarcerated women with histories of childhood sexual and/or physical abuse showed improvements on psychometric measures of mood, PTSD symptoms, and interpersonal functioning.

Feminist Therapy. While feminist therapy can utilize any technique that is both egalitarian and empowering (Brown, 2004), feminist therapists are distinguished by their efforts to bring to light for female trauma survivors the ways in which their traumatic events are part of a long cultural history of violence and oppression of women. The goal of feminist therapy for interpersonal violence is to help clients realize that the violence did not occur because of an individual flaw, but rather because of their membership in an oppressed group. Thus, the therapy may often take an exploratory approach in which the context of the event, the gendered nature of abuse, the added impact that violence has on women because of their already-subjugated cultural role, the ways in which women are culturally disbelieved about their traumas, and existential issues brought about by the trauma are all included in session content. Brown (2004) and Worell (2001) note that the

goal of feminist therapy is not simply the abatement of symptoms, but the restoration of a secure sense of self that has undergone existential and spiritual healing. Unfortunately, feminist therapies for interpersonal violence are underrepresented in the empirical literature.

Meta-analytic Comparison of Therapeutic Approaches

Several meta-analyses have examined the effects of therapy on reducing PTSD symptoms. In an unpublished dissertation, Chard (1995) examined the effects of cognitive, cognitive-behavioral, psychodynamic, supportive and other therapies with women who had survived interpersonal violence. Naturalistic as well as controlled trials were included in the meta-analysis, as were group and individual treatments. Outcomes included subjective improvement, PTSD symptoms, depression symptoms, and interpersonal functioning. No significant differences were found across treatment modalities, and effect sizes post-treatment ranged from d = .89 (supportive therapy) to d = 2.47 (cognitive therapy). Cognitive, cognitive-behavioral, supportive, psychodynamic and other therapies had effect sizes of d = 2.24, .99, .89, 1.88 and 1.83, respectively. Thus, purportedly distinct therapy approaches (e.g., psychodynamic and cognitive) had similar effects on a variety of domains of functioning. One possible explanation for the similarity between psychotherapeutic processes is the importance of common factors, such as working alliance, in predicting psychotherapeutic outcome (e.g., Wampold, 2001). Another is the potential overlap between treatments with different names but common techniques (Ablon & Jones, 1998; Pole, Ablon, & O'Connor, 2008).

Sherman (1998) conducted a meta-analysis on treatments for PTSD that examined treatment effects by PTSD symptom cluster (i.e., intrusion, avoidance/numbing, and hyperarousal symptoms). The overall effect sizes for intrusion, avoidance/numbing and hyperarousal symptoms using mostly cognitive-behavioral therapies as compared to inert treatment conditions were .62, .79 and .58 (Cohen's *d*), respectively. Also included were effect sizes for general anxiety (*d* = .53) and depression (*d* = .55) symptoms. Thus, it appears that avoidance/numbing symptoms are among the symptoms best addressed by therapy, while general depression and anxiety are less well-addressed by the included therapy approaches. The most recent meta-analysis on the topic by Bradley et al. (2005) included only randomized controlled trials (RCT). They found that there were too few psychodynamic RCT studies to include in the meta-analyses, and too few articles published on different types of therapies to compare approaches. However, pre-therapy-post-therapy effect sizes for exposure therapy, cognitive restructuring plus exposure, EMDR, and other cognitive-behavioral therapies were large and relatively similar (*d* = 1.43 to 1.66). Effect sizes of target treatment (usually cognitive or behavioral) compared with supportive therapy (which focuses on relieving distress and validation) control groups were slightly smaller (*d* = .57 to 1.01).

Taken together, we have tentative information that says that therapy following interpersonal violence is beneficial to clients. Caution is warranted because some of these findings are based on pre-post therapy comparisons without reference to an appropriate control group. Moreover, the meta-analytic findings are largely based on self-report and subjective symptom-based assessments of therapy outcomes. Yet, a large body of knowledge has been amassed that describes behavioral and physiological

changes following trauma. Thus, it may be beneficial for more rigorous evaluations to examine behavioral and physiological changes following interpersonal violence as the basis for an objective view on assessing post-trauma therapy outcomes.

Cognitive, Emotional and Physiological Changes Following Traumatic Events

In addition to the body of literature on how trauma responses can be treated, significant attention has been devoted to explaining why trauma exposure leads to psychological dysfunction. It is impossible at this point to determine whether functional changes associated with trauma represent vulnerabilities and/or concomitants of symptoms, or are simply changes that occur alongside symptoms. However, theorists have used laboratory-based experimental data as a means of testing theories about what, aside from a traumatic event, contributes to trauma symptoms. Broadly speaking, the two main types of theories that attempt to explain why trauma symptoms occur are cognitive/information processing theories and physiological/emotion regulation theories. Targets for exploration in this vein have included cognitive appraisals (Resick & Schnicke, 1992), attentional changes (Buckley, Blanchard, & Neill, 2000; Elsesser, Sartory, & Tackenberg, 2004; Kuiken, Bears, Miall, & Smith, 2001), implicit and explicit memory (Holmes, Brewin, & Hennessy, 2004; Michael, Ehlers, & Halligan, 2005; van Minnen, Arntz, & Keijsers, 2002); emotion regulation (Orsillo, Batten, Plumb, Luterek & Roessner, 2004; Renneberg, Heyn, Gebhard, & Bachmann, 2005), and physiological hyperarousal (DePrince & Freyd, 2001; Orr & Pitman, 1993; van der Kolk, Hopper, & Osterman, 2001).

Cognitive/Information Processing Theories

Perhaps the most empirically tested of the trauma theories, cognitive/information processing theories have been derived from knowledge gleaned from cognitive psychology-based laboratory paradigms. Such paradigms have assessed the roles of attention, appraisal, implicit and explicit memory for trauma-related stimuli, and narrative memory structure in creating and maintaining symptoms. Foa and Rothbaum (1998) offer a learning-based trauma reaction theory. They propose that reactions to trauma are primarily sustained through classical conditioning, whereby associations to neutral stimuli (i.e., environmental stimuli that are not inherently traumatic) become associated with the traumatic event itself. They posit that classical conditioning in turn creates "fear networks" that include over-generalized associations with the traumatic event. Because information has not been fully processed, trauma survivors selectively attend to trauma-related stimuli that lead to a cascade of other symptoms.

Multiple studies have used the *emotional Stroop paradigm* to assess attentional biases in psychopathology (e.g., Foa et al., 1991; Freyd, Martorello, Alvaredo, Hayes & Christman, 1998; Paelecke-Habermann, Pohl & Lepow, 2005; McNally, Kaspi, Riemann, & Zeitlin, 1990). In the Stroop task, participants are presented with a list of words that appear in different ink colors. They are then asked to name the color of the ink, rather than the words themselves. Decreased color naming time when the words are threat-related *(called Stroop interference)* is thought to represent an increase in attentional allocation towards processing threat stimuli. Studies by Foa (1991); Cassidy, McNally, and Zeitlin (1992); Bryant and Harvey (1995); McNally, Kaspi, Reimann, and Zeitlin

(1990) have demonstrated Stroop interference with rape survivors, MVA survivors, and Vietnam combat veterans.

In contrast to learning theories, researchers such as Resick and Schnicke (1992) and Horowitz (1976) have focused on the role of conscious appraisal in trauma symptoms. Resick and Schnicke (1992) note that women often experience guilt and shame following violent events, perhaps in part as a maladaptive attempt to retain perceived control over their environment. A meta-analysis has summarized the findings on whether appraisals for traumatic events predict PTSD symptoms. Ozer, Best, Lipsey, and Weiss (2003) found that across studies, appraisals that one's life was in danger, and reactions such as intense emotions (i.e., helplessness, guilt, and shame) significantly predicted PTSD symptoms in trauma survivors (r = .36 and r = .26, respectively). It is of note that while feelings of helplessness, guilt and shame are emotions and not cognitions, they are reflective of the ways that people appraised their role in the event.

Feminist theory has adapted the idea of cognitive schemas to incorporate a sociological explanation of appraisals associated with trauma (Brown, 2004). This theory asserts that the presence of widespread misogyny devalues women, and violence reinforces and encourages internalization of these devaluing messages, leading to cognitive schemas of helplessness and self-blame (Brown, 2004). Female interpersonal violence survivors are negatively impacted by such social messages because the messages create a blockade against empowerment, or feelings of self-efficacy and capacity for self-assertion (Johnson et al., 2005). Feminist therapy considers empowerment to be the means of combating internalized misogyny (Johnson et al., 2005). To emphasize the importance of empowerment in victims of violence, Johnson et

al. (2005) tested the relationship between therapeutic provision of empowerment and mental health improvement in battered women. They found that increases in self-reported empowerment predicted increased well-being and decreased psychiatric symptomotology (both assessed by self report). Thus, the idea that appraisals of traumatic events may lead to symptom expression has some empirical support.

Trauma-induced memory disruptions have also been the subject of investigation. The cognitive psychology literature often defines *implicit memory* as the ability of nonconscious material to impact thoughts and behavior, despite the initial stimulus presentation being forgotten or unnoticed (Michael, Ehlers, & Halligan, 2005). Implicit memory contrasts with explicit memory. Explicit memories more closely fit the prototype of "typical" memories, and include memories of life events that can easily be verbalized (Brewin et al., 1996). Several investigators have made attempts to address implicit memory for trauma stimuli in trauma survivors using "priming" paradigms such as the *word-stem completion task* (McNally & Amir, 1996; Michael, Ehlers, & Halligan, 2005; Golier, Yehuda, Lupien, & Harvey, 2003). Participants are shown a list of words but not directed to memorize them. Then, they are later shown the word stems from the words they have viewed (e.g., "for---" is the stem of "forced") and asked to fill in the rest of the word with the first word that comes to mind. Participants are judged to have enhanced implicit memory if they select words that they have previously viewed. Word-stem completion tasks with priming have been successful in distinguishing participants with and without depression and anxiety in multiple studies (e.g., Cooley & Stringer, 1998; Eysenk & Byrne, 1994; Tosun & Dag, 2000). Several studies have utilized this and similar priming methodologies to search for evidence of enhanced implicit memory for

trauma material in trauma survivors. Research by Golier, Yehuda, Lupien, and Harvey (2003) and McNally and Amir (1996) have found no evident priming effects for trauma material when comparing people with and without PTSD symptoms who had all been exposed to trauma. However, Golier et al. (2003) found that people with PTSD did show greater explicit memory recall for trauma-related words. In contrast, a recent study by Michael et al. (2005) demonstrated increased implicit memory in traumatized patients when utilizing a modified version of the word stem completion task. The modification included a presentation of matched "competing" words in addition to trauma-relevant words. For example, participants were primed with the words "victim" and "vicarious." Michael et al. found that people with PTSD were more likely to complete word stems with trauma-related words. Furthermore, they found that enhanced priming for implicit memory material soon after a traumatic event predicted PTSD symptoms 3, 6, and 9 months post-trauma. These findings indicate that trauma-relevant material can leave lasting effects even when it goes unnoticed or disregarded, highlighting the importance of fully processing traumatic memories. Additionally, these findings hint at the possibility that examining unconscious material may be beneficial to trauma survivors.

Biological and Emotion Regulation Differences Associated with Trauma

Physiological changes in neuroanatomy, neuroendocrine function, and autonomic arousal have been frequently documented among trauma survivors. Autonomic abnormalities, changes in levels of stress hormones, and changes in brain structure have been linked to child abuse survivors with depression (Heim 2000), PTSD (Bremner et al., 2005; Bremner et al., 2004; McDonagh-Coyle et al., 2001; Rellini & Meston, 2006) , and

BPD (Bremner et al., 2004; Ebner-Priemer et al., 2005). Even among people without psychopathology, investigators have found that adults who experienced traumatic events as children have increased physiological stress responses (Heim, 2000; Otte et al., 2005; (Pole et al., 2007). Several studies have utilized standardized trauma cues, such as film clips or photographs, to provide evidence that trauma survivors have increased physiological arousal (e.g., DePrince & Freyd, 2001; Pole, 2007).

Porges' *Polyvagal Theory* (1995, 2003, 2007) may be important to consider when examining physiological arousal in trauma survivors. This theory asserts that there are multiple autonomic controls and stress responses systems in mammals: the sympathetic nervous system (SNS), and the parasympathetic nervous system (PNS), which is further subdivided into two distinct branches called the myelinated and unmyelinated vagus (Porges, 1995). The SNS is responsible for active threat responses and is typically accompanied by increased heart rate and skin conductance (Andreassi, 2007). The myelinated vagus applies a "brake" to the "gas" applied by the SNS (Sack, Hopper, & Lamprecht, 2004). The myelinated vagus also facilitates emotional expressivity, responsivity to social cues and social engagement (Porges, 2003). Myelinated vagal activity is measured by respiratory sinus arrhythmia, or RSA (Grossman, 1983; Grossman, Karemaker, & Wieling, 1991). Withdrawal of the myelinated vagus can "make way" for SNS activation in threatening situation; its reassertion can restore homeostasis. Therefore, elevations in heart rate can reflect both SNS activation and myelinated vagus withdrawal. In contrast, the unmyelinated vagus represents a more primitive threat response that results in slow, shallow breathing; drops in blood pressure; and decreased heart rate. These responses manifest as passive threat responses such as

vasovagal syncope, “freezing” and “feigned death.” For a review see Porges (2007). If heart rate is relatively low and correlated with RSA then one might conclude an influence of myelinated vagus activity. This conclusion is necessarily indirect because there is no direct measure of unmyelinated vagal activity without pharmacological blockade. Low heart rate levels with relatively high skin conductance levels could suggest myelinated vagus activity paired with SNS activity. Uncorrelated heart rate and RSA accompanied by relatively low skin conductance levels could indicate both sympathetic withdrawal and unmyelinated vagal activity indicative a passive threat response (Sahar, Shalev, & Porges, 2001).

In contrast to physiological regulation of responses to traumatic stimuli, emotion regulation focuses on how people consciously regulate what they are experiencing. The ability to notice and manage one’s emotions is an important skill for maintaining healthy emotional, cognitive and social functioning (Gross, 2002). Emotion regulation can be defined as “the processes by which we influence which emotions we have, when we have them, and how we experience and express them” (Gross, 2002, p. 282). However, disturbances in the ability to regulate emotions is often a consequence of traumatization (Levitt & Cloitre, 2005). Emotion dysregulation can manifest in dissociation (van der Kolk et al., 1996), numbing (Wastell, 2002), self-injury (Linehan, 1993), explosive anger (Levitt & Cloitre, 2005) and suicidal behavior (Bohus et al., 2005). Among emotion regulation strategies, Wastell (2002) found that greater emotion suppression was linked with greater psychopathology in traumatized people.

Other studies have examined the emotional reactions of traumatized women using emotionally-evocative stimuli. Orsillo et al. (2004) utilized a paradigm in which women

with and without with PTSD from interpersonal violence were shown films with fear- and anger-related content Facial expressions were coded, and emotional reactions were measured via self-report. The women with PTSD did not differ from the women without PTSD in facial expressions but they reported greater negative emotional reactions to the films. Renneberg et al. (2005) compared the emotional reactions of women with depression or borderline personality disorder (BPD) to non-patient controls while watching film clips. Facial expressions were coded as positive or negative. People with depression and BPD showed less facial reactions to both positive and negative films. Thus, it may be the case that women with trauma-related psychopathology become numb or have difficulty regulating negative emotions, though this difficulty is not reflected in facial expressions.

Therapy-related changes in cognitive, physiological and emotional functioning.

Though the literature at large has focused on symptom-based assessment, several studies have set a precedent for examining how objective post-trauma functioning changes after therapy. While it is certainly interesting to have detailed knowledge of how people are objectively changed by traumatic events, this knowledge could have further value if applied to assess treatment outcomes. Though in its early stages, attempts to provide data on behavioral and physiological therapy outcomes provide a glimpse into the ways in which therapy can effectively target outcomes beyond self-reported symptoms.

Post-treatment changes in attentional biases. Foa et al. (1991) made use of the Emotional Stroop paradigm to examine differences in women with and without PTSD.

Fifteen sexual assault survivors with PTSD, 14 sexual assault survivors without PTSD, and 16 women with no assault history completed a Stroop paradigm utilizing assault-related, general anxiety and neutral word lists. The women who had experienced sexual assault but did not have PTSD had successfully been treated with PE. Women with PTSD had significantly greater Stroop interference effects for assault-related words than assaulted women without PTSD and than women with no assault history. Furthermore, women with PTSD had significantly greater Stroop interference effects for assault-related words than for neutral and general anxiety words. This study provides tentative indications that women who have had assault-related PTSD may have improved Stroop performance (and thus reduced attentional bias) task following successful prolonged exposure therapy.

Post-treatment changes in physiology. Lindlauer et al. (2006) tested the physiological effects of an eclectic therapy that combined prolonged exposure and psychodynamic techniques. They found that traumatized patients who underwent successful eclectic therapy had significant post-treatment reductions in heart rate when exposed to traumatic stimuli. Similarly, Forbes, Creamer, and Rycroft (1994) found that EMDR led to decreases in forehead muscle tension immediately following treatment and at a three-month follow-up in eight trauma-exposed participants. Wilson, Silver, Covi, & Foster (1996) provided a single session of EMDR to 18 participants who were distressed by traumatic memories. All participants evidenced a decrease in autonomic activity. Shalev, Orr, & Pitman (1992) and Boudewyns and Hyer (1990) also reported similar changes in physiological arousal to an imagery task following treatment with prolonged

exposure. Thus, it appears as though psychotherapy for trauma can be associated with changes in physiological arousal.

Implications for therapy

Given the very high prevalence of interpersonal violence perpetrated against women and girls, they have been largely neglected by the psychotherapy literature. Twenty percent of women experience a sexually assaultive event in their lifetime (Resnick and Kilpatrick, 1993; Koss, 1993); 12% of women experience severe relationship violence (Straus & Gelles, 1990). Up to 50% of women who experience sexual assault alone will develop PTSD (Kessler et al., 1995); these data do not begin to address how multiple forms of violence and repeated victimization affect women in life-altering ways beyond PTSD. And yet, the literature at large offers far too few studies on how the lives of violence survivors are altered in ways beyond PTSD symptoms. The few studies that are offered tend to focus narrowly on male Vietnam Veterans or on female sexual assault survivors with a single diagnosis (Bradley et al., 2005). More attention is needed to address the multiple forms of interpersonal violence in women, including domestic and intimate partner violence.

However, there have been some positive steps taken on the road to understanding the treatment of interpersonal violence in women. So far, we know that psychotherapy is helpful in ameliorating some suffering related to violence but that single-technique psychotherapy may not provide complete relief to everyone (e.g., Bradley et al, 2005). We know that many women who have experienced interpersonal violence have difficulties with information processing, attention, memory, physiological dysregulation

and emotion regulation. These facts have the potential to provide important guidance for how one might go about assisting trauma survivors. For example, if information processing theories are correct in asserting that part of what maintains symptoms is a difficulty with extinguishing implicit memories, therapy techniques such as bringing unconscious material into consciousness and reconstructing memories may be an important step on the way to the more conventionally prescribed exposure-based therapy. If learning-based theory is correct in its assertions, then helping clients to form new associations with trauma-related stimuli is an important path to pursue for trauma survivors. If psychodynamic theories are correct in their assumption that subconscious influences lead to the manifestation of symptoms, then helping clients reduce implicit memories of trauma would ameliorate symptoms. Thus, theory becomes a mechanism for organizing research efforts to guide treatment choices.

Unfortunately, RCTs overlook people who are struggling with issues related to interpersonal violence but who lack a formal psychiatric diagnosis. Second, the only forms of psychotherapy studies that have used objective and broad indicators of outcome are emotion-management therapies. However, commonly-practiced emotion-expression therapies have not made use of objective and broad outcomes. Thus, it is unclear whether therapy approaches commonly practiced in the community will affect outcomes on these measures similar to emotion-management approaches that are more widely tested in RCTs.

A further gap in the literature is an understanding of whether therapy approaches result in changes concordant with their theorized pathogenesis. For example, if psychodynamic psychotherapy helps clients recognize their subconscious reactions to the

traumatic events (Krupnick, 2004) then using an outcome assessment technique that targets subconscious mental contents would provide more treatment-specific knowledge of whether this therapeutic approach is succeeding in its goals. If prolonged exposure works through facilitating physiological habituation (Boudewyns & Hyer, 1990; Kozak, Foa, & Steketee, 1998; Shalev, Orr, & Pitman, 1992) then using a physiological challenge task will provide evidence of whether the theoretically-proposed mechanism of action is indeed accurate. And, as many forms of therapy focus on helping participants process the memory of traumatic events (Hopper & van der Kolk, 2001; Horowitz, 1976), examining the memories of traumatized clients before and after therapy will tell us if changes in memory structure are indeed necessary for symptom improvement. Though hypotheses of the specific effects of psychotherapy techniques on specific symptoms have been discredited by some (Ahn & Wampold, 2001), re-examining outcomes utilizing objective indicators of change may provide additional information about the specificity of therapy techniques (Spinhoven, Nijenhuis, & van Dyck, 1999).

Since data suggest that different types of therapies result in outcomes of similar magnitude, (e.g., Ablon & Jones, 1999; Chard, 1995; Imber et al., 1990), one might ask what differs about various therapeutic approaches? Generally, different theoretical orientations may have similar goals but use different techniques. One such example of similarity between distinct therapies is in their shared emphasis on trauma-related information processing. Psychodynamic therapies have referred to this process as "working through," while exposure-based therapies have referred to it as "information processing" or "integration." Both therapeutic approaches are describing a process by which traumatized clients make sense of traumatic events and reconstitute the memories

in a way that creates a coherent narrative memory. However, dynamic and exposure therapies have drastically different approaches to reaching this common goal. In dynamic therapy, a person may titrate his or her pace when revealing the details of a traumatic event, telling the story at a graded pace over weeks or perhaps years (Krupnick, 2002). The telling of the story can be interspersed with exploration and speculation about the event. In contrast, exposure therapies encourage a client to tell the story over and over again in a single session, even though doing so may be highly distressing to the client (e.g., Foa & Rothbaum, 1998). Both schools of thought agree that telling the trauma story is an important component of treatment, but they differ in how they think it should be told (e.g., in terms of pace and structure). Another example of different techniques aiming towards similar goals is the therapeutic focus on reducing shame and increasing feelings of security following trauma. In cognitive therapies, clients are encouraged to use logic or to develop new cognitions to battle their faulty beliefs (e.g., Foa & Rothbaum, 1998; Resick & Schnicke, 1992), while in psychodynamic and interpersonal therapies, an examination of the origins of such beliefs is used to combat shame and insecurity (e.g., Horowitz, 1976; Krupnick, 2004; Robertson et al., 2004). As of yet, it is unclear whether different techniques can achieve the same outcomes when the goals are the same. For example, it is unclear whether cognitive therapy and psychodynamic therapy can be equally effective in correcting distorted cognitions even though their approaches differ.

Given the similarity in goals, it may appear that there is significant similarity across therapeutic approaches about problems that need to be addressed for trauma survivors. Yet, approaches is differ in techniques, pace, and other dimensions such as a

focus on the past versus present. However, the debate over what techniques should be used with traumatized clients is currently being fought in researchers' rather than clinicians' territory. Generally speaking, clinicians do not use carefully-devised and closely-controlled manualized protocols to treat their clients (Bradley et al., 2005). Rather, clinicians tend to keep a "toolbox" of varying techniques and attempt to fit the technique to the needs of the client. For example, a seasoned clinician may be more directive and supportive with a low-functioning client, but more exploratory or challenging with someone who is more high-functioning (Jones, Cumming & Horowitz, 1988). Finally, the clients who participate in RCT designs tend to have less complex presentations than clients seen in general psychotherapy practice (Spinazzola, Blaustein & van der Kolk, 2005; Westen et al., 2004; Zayfert, et al, 2005). Thus, the research on therapy for trauma survivors faces the significant challenge of how to be more relevant to "real world" settings. Research on "real world" therapy, mostly conducted with effectiveness designs, gives evidence for the external validity of the results of the randomized trials.

Methods in psychotherapy research

Generally speaking, insight-oriented and expressive therapy (e.g., psychodynamic and interpersonal therapy) studies have made greater use of effectiveness designs than have cognitive-behavioral therapy studies, which seem to prefer efficacy designs (i.e., randomized clinical trials; Westen et al., 2005). One may note that having a therapy course that is ever-changing and following the experiences and stages of the client (as is often true of expressive therapies) would be difficult to manualize and standardize. A

problem that arises from this difference in research designs is difficulty in comparing studies. It is unclear how to compare an effectiveness design with an efficacy design. A second problem with comparing the two bodies of literature is that insight-oriented therapies have historically had less concrete goals and course than cognitive-behavioral therapies (Holtforth, Castonguay & Borkovec, 2004). Thus, the preferred means of assessing outcomes differs among treatment approaches. For much of the extant literature, study design, outcome measurement and therapy approach are confounded. For example, more "structured" treatments use more lab-based outcome measures, while naturalistic studies may tend towards idiosyncratic outcome measures. The result is that we cannot, as of yet, effectively compare therapeutic techniques.

Another unresolved difficulty in comparing therapy outcomes is that the different therapy approaches can have different ideas about what constitutes improvement (Sorensen, Gorsuch & Mintz, 1985). Cognitive-behavioral therapies tend to focus more on symptoms (Doss, 2004), while insight-oriented therapies tend to focus on improving more general functioning and personality (Chertoff, 1998; Grenyer & Luborsky, 1996). Insight-oriented approaches may value, for example, whether an individual is able to tolerate having "unacceptable" feelings or desires. Such an outcome can be difficult to measure. Furthermore, insight-oriented therapies may value a more idiosyncratic model of improvement. From this perspective, decreasing defensive behavior may be a valued goal for one individual, while for another, improving the use of defenses may be necessary for stabilization. Thus, the different therapy approaches may have largely discrepant goals for what they see as the necessary criteria for evaluating improvement.

One way of resolving the discrepancy of the different outcomes valued by different therapy approaches is to use broad means of assessment. It has been well-documented that trauma survivors report significant changes in more subjectively-assessed domains of interpersonal and symptom expression (e.g., Brewin, Andrews, & Valentine, 2001; Oddone, Genuis, & Violato, 2001; Ozer et al., 2003). However, more "objective" laboratory-based assessment techniques (such as assessment of physiological arousal) open possibilities for identifying other potentially concomitant changes (Arbuthnott, Arbuthnott & Rossiter, 2001; Briere & Elliot, 1997). The use of laboratory-based assessment has a number of advantages: 1) it can help overcome reporting biases in data drawn from self- and clinician-symptom reports, and may therefore provide a more accurate means of determining successful therapy outcome; 2) it may detect changes in functioning that may be critical but subtle, and, due to their subtlety, difficult to detect by clinicians and clients alike (for example, someone may not notice if they have ceased selectively attending to upsetting material); and 3) it may provide evidence to support or refute theories that provide explanations for symptom expression (e.g., if hyperarousal is the supposed reason for symptoms in PTSD, then it may be important to know whether symptom decreases correspond with decreases in hyperarousal).

A second approach that may bring cohesion to the fragmented trauma therapy literature is the use of a process-outcome design (Hill & Corbert, 1993). Process-outcome studies that follow naturalistic designs allow therapists to chart any course through the treatment that fits within a specific therapy framework. Psychotherapeutic techniques and processes are measured (rather than manipulated) and correlated with outcomes. Thus, a variety of therapeutic techniques may be employed, therapy may be tailored to

the individual client, and the process can be unobtrusively measured rather than prescribed.

The Present Study

The primary aim of the study is to understand which psychotherapy intervention techniques are associated with a broad range of positive treatment outcomes in this population. The secondary aims of the project are to extend the trauma treatment outcome literature beyond subjective reports of symptom measures to the realm of objective measures of cognitive and physiological functioning, and to examine how symptom change related to objectively-measured change. Post-trauma symptoms are reflected in measures of attention, memory and physiology. Symptoms may be caused by factors such as 1) increased attention allocation to trauma reminders, 2) persistent avoidance of trauma cues, 3) greater unconscious susceptibility to trauma cues, and physyiological dysregulation. Furthermore, contemporary therapeutic approaches intend to address the very cognitive and physiological disturbances which relate to symptoms. Examining the relationship of therapeutic processes to attention, memory and physiology may provide clarity with respect to mechanisms of recovery following trauma. Therefore, I explored the following hypotheses:

1) *Higher pre-therapy self-reported trauma symptom severity will be associated with abnormalities in laboratory-based measures of information processing and physiological arousal.*

Symptoms will be assessed via self-report. The Stroop task will be used to assess attentional biases. For the Stroop task, the primary hypothesis was that more severe PTSD intrusion (e.g., flashbacks) and hyperarousal (e.g. startle) symptoms will be

associated with fewer responses to the trauma/anxiety Stroop items, controlling for performance on the neutral Stroop items. The secondary hypotheses were that 1) more severe anxiety symptoms will be related to poorer performance on the anxiety-related Stroop items, 2) more severe depression symptoms will be related to poorer performance on depression-related Stroop items, and 3) dissociative symptoms will be also related to poorer performance on trauma/anxiety Stroop. Depression- and anxiety-related stimuli should be of relevance to people with depression and anxiety symptoms (Mogg & Bradley, 2005). As an associated feature of PTSD (APA, 2000), dissociation is thought to be linked to trauma, though less proximally than PTSD symptoms.

The Word Stem task will be used to assess implicit memory. On the Word Stem task, the primary hypothesis is that more severe PTSD intrusion and avoidance/numbing symptoms will be associated with greater implicit memory for trauma-related words. The priming component of the lab task may be an experimental analog to naturally-occurring trauma triggers. The secondary hypothesis is that anxiety symptoms will be related to more implicit memory for anxiety-related words. Material relevant to symptoms is more likely to be recalled in implicit memory, as symptoms may reflect susceptibility for retaining negative information.

A Slide Task will be used to assess emotional and physiological reactivity. On the Slide Task, the primary hypotheses are that more severe PTSD symptoms will be related to 1) higher heart rate, 2) higher skin conductance 3) lower RSA levels during the baseline and trauma slide portions of the task, and 4) uncorrelated HR and RSA during the trauma slides (Sahar et al., 2001). The secondary hypotheses are that anxiety symptoms will be related to 1) higher HR, 2) higher SC, and 3) lower RSA levels.

Additional secondary hypotheses are that dissociation symptoms will be related to 4) lower HR, 5) lower SC and 6) lower RSA levels during the trauma slides. Finally, interpersonal sensitivity will be related to 7) lower RSA levels during the trauma/recovery phases.

2) *Self-report symptom measures and laboratory measures will change from pre-therapy to post-therapy.*

The primary hypotheses are that PTSD symptoms, interpersonal sensitivity, depression and anxiety, and the client's area of greatest distress will decrease significantly from pre to post-therapy. The secondary hypotheses are that dissociation symptoms will change marginally, because dissociation is considered resistant to short-term therapy (Michelson, June, Vives, Testa, & Marchione, 1998; Rufer et al., 2006).

With regard to the Stroop task, the primary hypotheses are that trauma/anxiety Stroop performance will improve but neutral Stroop performance will not change. Therapy should help with impulse control in response to emotional distress, but should not change responses to emotionally-irrelevant material. If neutral conditions remain the same over time, it may suggest that changes are not due to practice effects. No secondary hypotheses are posited for the Stroop Task.

With regard to the Word Stem task, the primary hypotheses are that clients will show less implicit memory for trauma and anxiety words. Therapy should help participants to become more resilient to priming of trauma- and anxiety-related material and should also help participants be more aware of how subtle cues are influencing their behavior. The secondary hypotheses are that clients will show more implicit memory for

positive words because they will be more able to access and tolerate positive affect as a result of therapy.

With regard to the Slide task, the primary hypotheses are that participants will show decreases in HR and SCL activity and increases in RSA. Trauma exposure has been related to exaggerated HR and SCL, as well as poor emotion regulation as measured by RSA. No secondary hypotheses are posited with respect to the Slide Task.

Prior to examining the relationship of therapy process to change, other pre-therapy variables will be examined for their relationship with post-therapy change. The hypotheses are that: (1) clients with more and earlier trauma exposure and more pre-therapy dissociation will change less with respect to symptoms, cognitive tasks and physiology; (2) clients on psychotropic medications will be different in their degree of change; and (3) clients who continued versus discontinued treatment at the end of the study will show different magnitudes of post-therapy change.

3) *Changes in self-reported symptom severity over time will be associated with changes in information processing, cognition, emotion, and physiology.*

For the Stroop task, the primary hypotheses are that 1) PTSD intrusion symptom changes will be related to changes in trauma/anxiety Stroop Task performance and 2) hyperarousal symptom changes will be related to improvement in anxiety Stroop Task performance. The secondary hypotheses are that 1) changes in anxiety will be related to changes in the trauma/threat Stroop performance and 2) changes in the depression symptoms will be related to changes in the Depression Stroop performance.

For the Word Stem task, the primary hypotheses are that PTSD symptom changes will be related to changes in trauma and anxiety Word Stem task performance. Symptoms

occur in part because of susceptibility to priming (Litz, Orsillo, Kaloupek, & Weathers, 2000; Michael & Ehlers, 2007); thus, improvements in implicit memory will be reflected in symptom improvements. There were no secondary hypotheses are posited for this task.

For the Slide task, the primary hypotheses are that intrusion, avoidance/numbing, and hyperarousal will be related to changes in HR, SCL and RSA. The secondary hypotheses are that 1) dissociation changes will be related to changes in HR, RSA and SCL; 2) anxiety changes will be related to changes in HR, RSA and SCL; and 3) interpersonal sensitivity changes will be related to changes in RSA.

4) *Specific psychotherapy processes will be related to specific changes in self-report and laboratory measures.*

With regard to the symptom measures, the primary hypotheses are that greater trauma-focused prolonged exposure (PE) process, stress inoculation therapy (SIT) process, and trauma-related work on shame/guilt and meaning (SGM) process will all be associated with improvements in symptoms of PTSD, interpersonal sensitivity and depression. In particular, greater PE techniques will be related to avoidance/numbing and hyperarousal symptoms, as PE hypothesizes to reduce hyperarousal through blocking avoidance/numbing. Furthermore, greater SIT techniques will be especially related to hyperarousal and intrusion symptom improvement because of SIT's focus on recognizing triggers and reducing stress. Finally, SGM techniques will be related to improvements in interpersonal sensitivity and depression, because of PD's focus on interpersonally-triggered affects and on finding meaning in life. The secondary hypotheses are that working alliance, general PD and CBT therapy processes will related to changes in symptoms, as general PD and CBT have demonstrated improvements in symptoms of

anxiety, depression, interpersonal sensitivity and PTSD in other trauma-exposed samples. Working alliance has been related to change in other studies (Fenton, Cecero, Nich, Frankforter, & Carroll, 2001).

For the Stroop task, the primary hypotheses are that greater SIT techniques will be related to improvements in Stroop task performance because of its emphasis on recognizing triggers and coping with stressors through relaxation and stress management, which may impact intrusion symptoms. Because PE emphasizes techniques such as cognitive restructuring and encourages increased focus, and purports to help with information processing, more trauma-focused PE processes may be related to more improvement in Stroop. The secondary hypothesis is that general CBT techniques will be related to Stroop performance improvement because CBT focuses on increasing control over one's emotions.

For the Word Stem task, the primary hypotheses are that more trauma-focused SGM processes will be related to less post-therapy implicit memory for trauma cues. The rationale is that trauma-focused SGM emphasizes increasing awareness of how affect may influence behavior. More SIT technique will be related to less post-therapy implicit memory because SIT emphasizes awareness of how "triggers" and trauma reminders can generate symptoms and because primed stimuli may act as potential triggers. Finally, I hypothesize that more trauma-focused PE technique will be related to decreases in implicit memory because PE states that its goal is to aid in the processing of traumatic stimuli, and word stem is a measure of information processing. The secondary hypotheses are that PD techniques will be more related to improvements in word-stem than CBT

techniques, because PD techniques focus on increasing awareness of one's emotional responses.

For the slide task, primary hypotheses are that 1) SGM techniques will be related to changes in RSA and HR, 2) trauma-focused PE techniques will be related to changes in physiological arousal, and 3) trauma-focused SIT techniques will be related to changes in physiological arousal. The rationale for these hypotheses is that SGM emphasizes discussion of the intense affects, and aspects of physiology are linked to affect. Because PE emphasizes physiological habituation to stressors, I anticipate that trauma-focused PE will be related to reduced physiological arousal. Finally, SIT purports to directly change breathing and to induce physiological arousal. The secondary hypotheses for the slide task are that general PD processes will be more related to improvements in RSA because of its focus on relational processes, and that general CBT processes will be more related to improvements in HR and SCL because of its focus on habituation to threatening stressors.

Chapter II

Method

Overview. This project is a naturalistic pretest-posttest process-outcome study of psychotherapy for adult women who are survivors of interpersonal violence. To assess the therapeutic process, clients completed a measure of therapeutic alliance and therapists completed measures of in-session activities/techniques. To assess pre-therapy to post-therapy changes, I assessed psychiatric distress, information processing (e.g., attentional biases and implicit memory) and physiological activity through a combination of self-report and laboratory-based procedures prior to therapy and again following 12 therapy sessions. The pre-post therapy assessments were composed of self-report questionnaires and 3 laboratory tasks: 1) a Stroop task; 2) a Word-Stem Completion Task; and 3) a Slide Task with physiological recording.

Participants

Clients. Twenty-seven adult treatment-seeking women exposed to interpersonal violence (e.g., acquaintance or stranger rape, childhood physical or sexual abuse with known or unknown perpetrator, domestic violence) were recruited into the study. Women who experienced emotional abuse with no history of physical or sexual violence were excluded because emotional abuse does not currently meet the DSM-IV criteria of a traumatic event. Other exclusionary criteria included low levels of English literacy, being in a violent relationship within the last 6 months or ongoing stalking by the perpetrator,

and active psychosis. A minimal level of literacy was required because many of the laboratory procedures involved reading written English. Current involvement in a violent relationship would raise the risk to both participants and the investigators for possible retaliation by abusers, and make improvement in symptoms less likely. Active psychosis could impede the client's ability to engage in the laboratory tasks. Clients were recruited through two different procedures. In the first procedure, clients who presented to participating clinics throughout the Southeast Michigan area were given a basic description of the study and asked by clinicians to provide consent to be contacted by the researcher for further information. In the second procedure, clients responded to flyers that were posted throughout the community advertising a study on women with traumatic experiences who are just beginning therapy. Following a phone screen to verify eligibility, potential clients were informed of the study details including directions to the laboratory and availability of childcare. They were also asked to agree to attend at least 12 weekly psychotherapy sessions targeting psychological symptoms following from interpersonal violence. If they had not yet identified a therapist they were given an appropriate referral to an agency or clinician who had agreed to participate in the study. Clients were reimbursed $50 for each 2-hour laboratory session they attended, as well as up to $50 for their completion of all of the self-report measures. Payments were pro-rated if clients completed some aspects but not others of the laboratory procedures. Clients were given an additional $50 bonus for completing all aspects of the study in a timely fashion resulting in a total reimbursement of $200.

Therapists. Therapists in the Ann Arbor area who work with trauma-exposed clients were recruited for participation. Therapists were from a variety of theoretical

orientations (dynamic, interpersonal, cognitive behavioral, eclectic). They were recruited through a variety of means: 1) through advertisements at their clinics, 2) through their clients who contacted the study coordinator and 3) through the study coordinator. Both male and female therapists were included. Therapists were reimbursed $20 for participation in the study. Therapy fee structure was negotiated between the client and therapist. The researcher and the university assumed no responsibility for quality or payment of therapeutic services.

Procedure.

There were three procedural phases to the study: 1) pre-therapy assessment of clients; 2) assessment of therapy; and 3) post-therapy assessment of clients.

Pre-therapy assessment. The pre-therapy assessment of clients involved 1) questionnaires; 2) an interview, and 3) the laboratory assessment using the Word-Stem Completion Task, the Stroop Task and the Slide Task.

Questionnaires and Interview. Following provision of informed consent including consent for the therapist to release information to the study, clients completed the demographic questionnaire, and the Brief Symptom Inventory (BSI), the Dissociative Experiences Scale (DES), the Posttraumatic Stress Disorder Checklist (PCL) and the Trauma History Questionnaire (THQ).

Next, clients were briefly interviewed for their trauma history. They were given the following prompt:

> "As you know, this is a study for women who have experienced violence. I'd like to know as much as you are comfortable telling me about your experiences with violence. I know for some people, they've had a lot of events over their lifetime.

It might help to give me a general outline, but then focus in on the details of an event or two that really stands out in your head or seems like the most important. I will not ask any questions or comment until you finish speaking, and then will only ask questions to clarify your story."

The interviews lasted anywhere from 2-45 minutes. Following the interview, clients were then fitted with sensors to measure the physiological parameters described below. The remainder of the assessment was conducted in the following order: (1) Word Stem Completion Task, (2) Stroop task, and (3) Slide task. Each procedure is described in detail below. The typical client completed the lab session within two hours.

A Word-Stem Completion Task was used to assess explicit and implicit memory following a procedure outlined by Michael, Ehlers and Halligan (2005). This task utilizes three phases: 1) priming, 2) implicit memory recall, and 3) explicit memory recall. The purpose of the priming phase of the task was simply to allow for an opportunity for participants to encode word stimuli. Participants were asked to watch the words on the screen as they responded to an attention task. The target words (trauma-related words, aversive words, and neutral words) as well as the matched words appeared in a fixed random order. Participants viewed a series of 20 target trauma-related words, 12 target threat-related words, 12 target positive words and 12 target neutral words as well as words that matched the stems of the target words (Word lists are presented in Appendix 10). For example, a target word might be "threatened" and a matched word might be "theme" with a common word stem "th-." Each word disappeared after 1 second and an "X" then appeared randomly on either the left or right side of the screen. Clients pressed a button to indicate which side the X appeared on. The task began with two practice

words. In the *implicit memory recall* component of the task, clients were presented with the common word stems for up to 5 seconds (e.g., "th_____" for the words "threatened" and "theme"). Clients were asked to say the first word that came to mind and the experimenter recorded their response. The first two stems were not connected with any of the primed stimuli but were used for practice. In the *explicit memory recall* component of the task, clients were asked to write down as many of the words as they could remember from the priming task. The entirety of the three phases of the task took approximately 15 minutes. The task was scored by subtracting the number of affective (trauma, threat, or positive) words chosen to complete word stems from the number of matched neutral words chosen to complete word stems. Clients who recalled more affective words than matched neutral words, controlling for the number of explicitly recalled affective words (see below), were considered to have an implicit memory bias for trauma stimuli.

Stroop Task. The Emotional Stroop assessed attentional biases for supraliminal trauma-relevant information (e.g., Foa et al., 1991). In addition to a practice list, two word lists of each of the following types were displayed: neutral (e.g., grape, watermelon), positive (e.g., safe, cuddle), anxiety-related (e.g., worry, coffin), depression-related (e.g., despised, lonely) and trauma-related (e.g., nightmare, rape). Words were largely drawn from previous studies on similar populations (e.g., Foa, 1991; see Appendix 11 for examples). Each list contained 8 words presented 5 times for a total of 40 words per list. The words were randomly presented in either black, green, blue, or red ink with each color appearing an equal number of times in each list. Lists appeared in the following fixed order: neutral, positive, negative, depression-related and trauma-

related. The order of the lists represents a hierarchical increase in negative emotion as recommended by McNally et al. (1990), who found that early presentation of trauma-related words contaminated later attention to neutral words. Each list was presented once in its entirety on a computer screen. The clients were asked to name the colors as quickly as they could in order within 15 seconds without reading the words. Responses and errors were recorded by a research assistant and a tape recorder. There was a five second break between each list. The task took approximately five minutes to complete. Scores were determined by counting the number of correct responses given in each list within the time limit. Total word-colors read across each category were averaged among the lists for that category (e.g., neutral, trauma).

Slide Task. The Slide Task assessed emotional and physiological responses to standardized trauma cues. Following a 2 minute resting baseline, clients viewed 10 positive pictures. Following a 30 second break, clients viewed a set of 10 trauma-related pictures. Each picture was viewed for five seconds with three seconds between each picture. Following the presentation of pictures, clients were monitored for a recovery period. During the recovery period, clients were instructed to try to return to a calm resting state. Studies have indicated that physiological reactivity to trauma-relevant stimuli has high test-retest reliability in PTSD (Orr et al, 1998; Orr, Pitman, Lasko & Herz, 1993; Keane et al., 1988; Waters et al., 1987). This procedure lasted approximately 10 minutes.

Assessment of therapy. Following the laboratory procedures, the release of information signed by the participant was shared with the participant's therapist. Therapists were also asked to provide written consent for their participation. The

therapist received a Therapist Demographic Questionnaire, Trauma-Focused Psychotherapy Process Inventory-Therapist Version (TFPPI), and Psychotherapy Q-Set (PQS) before the twelfth session (Measures described in detail below). A client version was also completed but not utilized in the present study. Clients or therapists were contacted to monitor the number of sessions that the clients had attended. On average, it took clients 15 weeks to attend 12 therapy sessions. The format was individual sessions, though two clients attended concurrent group therapy conducted by their individual therapist. At the completion of 12 sessions, clients returned for their post-therapy assessment (see below), where they completed the Working Alliance Inventory (WAI). Therapists were contacted to inform them of their clients' completion of the study, at which time therapists completed the Therapist Demographic Questionnaire and the therapist versions of the PQS and TFPPI.

Post Therapy Assessments. The post-therapy assessment utilized the same questionnaires as the pre-therapy assessment, with several exceptions: the demographics questionnaire and THQ were not re-administered. The interview and laboratory assessments were all conducted using the same procedures as the pre-therapy assessment.

Materials.

Demographics. Clients were administered a demographic questionnaire that inquired about their race, socioeconomic status, education level, sexual orientation, and physical health.

The *Brief Symptom Inventory* (BSI; Derogatis & Spencer, 1982) is a 53-item client self-report measure designed to assess common psychiatric symptoms and psychological distress within the last week. The BSI yields nine subscales: somatization,

depression, psychoticism, obsession/compulsion, interpersonal sensitivity, anxiety, hostility, phobic anxiety, and paranoid ideation. For the purpose of this study, participants' area of most severe symptomotology of the nine subscales was used in analyses, as were the depression, anxiety and interpersonal sensitivity subscales. The subscales are yielded by averaging responses to particular items. Items are scored 1 (not at all) to 5 (extremely). Test-retest reliability of the overall BSI is acceptable to high (r = .68 – .91) and internal consistency of the subscales is acceptable to high (alpha = .71-.85) (Derogatis & Melistaratos, 1983). See Appendix 5 for items.

The *Dissociative Experiences Scale* (DES; Carlson & Putnam, 1993) is a 28-item client self-report measure of dissociative experiences including depersonalization, derealization, absorption and amnesia. Dissociation is an associated feature of PTSD (American Psychiatric Association, 2000) and a commonly-reported trauma response, particularly in people traumatized as children (e.g., Chard, 2005). Sample items from the DES include "some people have the feeling that their body does not belong to them" and "some people have the experience of not knowing whether things they remember happening really happened or whether they just dreamed them." Clients were asked to indicate how often they experienced a given symptom (i.e., from 0-100% of the time). A cutoff score of 30 is used to indicate pathological dissociation (Carlson, Putnam, Ross & Torem, 1993). Test-retest reliability for the DES ranges from r = .78-.96 (Dubester & Braun, 1995). Investigators have found significant decreases in DES scores of traumatized women who were successfully treated by therapy (Chard, 2005; Stalker & Frye, 1999). See Appendix 4 for items.

The *Posttraumatic Stress Disorder Checklist* (PCL; Weathers et al., 1993) is a client self-report measure of the 17 PTSD symptoms comprising DSM-IV criteria B through D (i.e., intrusion, avoidance/numbing and hyperarousal symptom clusters). Participants are asked to rate their symptoms over the past month, and were prompted to respond with respect to the events they described in an interview. Symptoms are rated for severity on a 5-point Likert scale and then summed to yield an overall score. Though frequency was measured separately for each item, only severity ratings were used in the present study. The PCL yields three subscales that are analogous to the intrusion, avoidance/numbing and hyperarousal clusters of PTSD symptoms described in DSM-IV. The recommended cutoff for a diagnosis of PTSD with the PCL is 44; at this cutoff, the PCL has a sensitivity of .94 and a specificity of .86 when compared to the diagnostic gold standard, the Clinician-Administered PTSD Scale (CAPS). However, the PCL does not establish symptom duration or time of onset. Internal consistency for the scale is high (Cronbach's alpha = .94) (Blanchard, Jones-Alexander, Buckley & Forneris, 1996). Test-retest reliability has been high with the PCL for people who immediately re-complete the scale (r = .92) but diminishes with longer intervals between testing (r = .66 after 2 weeks) (Ruggiero, Del Ben, Scotti & Rabalais 2003). See Appendix 3 for items.

The *Trauma History Questionnaire* (THQ; Green, 1996) was used to assess the clients' lifetime exposure to potentially traumatic events (e.g., accidents, sexual assaults, muggings, disasters); age of first and last experience of each event; and the number of exposures to each event. For the purposes of this study, the instrument was reduced to three variables: 1) age of first potentially-traumatic event, 2) number of different types of events experienced (e.g., sexual assault plus physical assault = 2 types), and 3) total

number of events experienced (e.g., 3 sexual assaults plus 5 physical assaults = 8 events). See Appendix 6 for items.

The *Working Alliance Inventory* (WAI; Horvath & Greenberg, 1986) assesses the strength of the working relationship between the client and therapist. The measure was completed by clients using a 12-item scale with three subscales relating to tasks of therapy, agreement upon goals, and client-therapist bond. Internal consistency of the subscales ranges from .77- .98, and construct validity appears to be strong (Cecero, Fenton, Nich, Frankforter, & Carroll, 2001). The WAI has good predictive validity with respect to treatment outcome (Fenton et al., 2001). See Appendix 7 for items.

The *Therapist Demographic Questionnaire* (created for this study) was completed by the therapists regarding their age, gender, educational background, stage of training, specialization, therapeutic allegiance, primary therapeutic orientation with the client in question, and satisfaction working as a clinician. Clinicians were given the option of choosing among the following orientations: psychoanalytic, psychodynamic, cognitive-behavioral, humanistic, feminist, control-mastery, and other.

The *Psychotherapy Process Q-set* (PQS; Jones, 1985) is a set of 100 psychotherapy process items. The PQS has subscales that assess cognitive-behavioral, interpersonal and psychodynamic psychotherapies. These "prototype" subscales were selected on the basis of ratings from internationally recognized experts on each of these theories and described in two studies (Ablon & Jones, 1998, 2002). Therapists rated items such as "Therapist's remarks are aimed at facilitating patient speech" and "The patient's treatment goals are discussed." Items were designed to be descriptive and include a broad range of treatment techniques. Ratings were made on a nine-point scale with responses

ranging from 1 (extremely uncharacteristic or negatively salient as part of their work with the client) to 9 (extremely characteristic or salient with regard to their therapeutic work). In order to score the measure, participants' ratings of each item are correlated with ratings associated with each prototype item. The correlation between actual and ideal therapy process represented the degree to which participants adhered to ideals of psychodynamic or cognitive-behavioral therapy. Items were divided into *client-behavior* items (e.g., "Client expressed angry or aggressive feelings"), *therapist-behavior* items (e.g., "Therapist drew attention to client's non-verbal behavior) and *interaction items* (e.g., "Memories of childhood were topics of discussion"). For the purpose of this study, only therapist-behavior items were analyzed. (See Appendix 9 for all items.) The PQS has been used by observers of taped sessions (Jones & Pulos, 1993; Pole, Ablon and O'Connor, 2008) and self-report format (Ablon & Jones, 1998). Reliability and validity of the PQS items have been demonstrated with a variety of treatment populations (e.g., Jones, Cumming & Pulos, 1993; Pole, Ablon and O'Connor, 2008). Interrater reliability for the PQS is high, ranging from r = .82-.89 for two raters; the PQS also appears to have strong discriminant validity with respect to its abilities to differentiate therapeutic approaches. In this study, the internal consistency of subscales was as follows: Psychodynamic therapy, alpha = .79; CBT, alpha = .73. See Table 3. It is important to note the affiliation of a process with a prototype as listed in this table does not mean that the process is under the exclusive domain of that prototype; rather, it is simply most characteristic of that prototype.

The *Trauma-Focused Psychotherapy Process Inventory* (TFPPI; created for use in this study) is a 43-item self-report measure of therapist and client behaviors. Items

were designed to be descriptive of the therapy process and are worded in pantheoretical terms (i.e., avoiding references to jargon specific to any one school of therapy). Items for the scale were derived from descriptions of Horowitz's (1976) description of trauma therapy, cognitive, cognitive-behavioral, exposure, feminist, EMDR, cognitive restructuring and dialectical behavior therapies. Items were divided into three subscales: trauma-related work on shame/guilt and meaning (SGM), prolonged exposure (PE), and stress-inoculation (SIT). Questions related to feminist therapy and dialectical behavior therapy were not included because they were rarely practiced by the sample. Though SIT is a form of CBT, it was analyzed separately from trauma-focused PE. Some researchers have argued that the relaxation elements of SIT blunt the effects of trauma-focused PE because the components of relaxation training in SIT may be utilized as avoidance techniques in exposure-based therapy (Foa, Feske, Murdock, Kozak, & McCarthy, 1991). Therefore, SIT may be contraindicated when conducting trauma-focused PE. Because SIT and trauma-focused PE may represent two distinct forms of CBT, they were analyzed as separate techniques. More importantly, recent updates of PE have recommended removing cognitive restructuring from the PE protocol because a) no added improvement is found with adding cognitive components and b) cognitive restructuring may be used as avoidance activities, reducing the effectiveness of exposure (Foa et al., 2005).The adequacy of scale reliabilities for each of these scales supports this decision. Scale reliability values for each subscale were as follows: stress inoculation therapy, $\alpha = .82$, trauma-related work on shame/guilt and meaning, $\alpha = .69$, and prolonged exposure, $\alpha = .73$. See Table 3 for means; see Appendix 8 for instructions and 9 for items. Only items specific to therapist behaviors were used. It is important to note that there is some

overlap in therapeutic techniques amongst different types of therapy. For example, both general psychodynamic therapy and general CBT advocate conveying non-judgmental acceptance, but that process is not rated by CBT experts as "central" to CBT (Ablon & Jones, 1998, 1999). Thus, these scale titles represent clusters of techniques that are centrally associated with one another based upon key literature.

Stroop and Word-Stem Stimulus Materials. Trauma-related words were selected from prior studies using the Stroop and Word-Stem with traumatized populations (e.g., (Paunovic, Lundh, & Ost, 2002) (Foa et al., 1991). Names of fruits were chosen as match words for the neutral Stroop so that words on each list would draw from a similar semantic network. For the Word-Stem Completion Task, positive words were chosen from a pool of standardized words that matched with the anxiety, depression and trauma words on the degree of arousal they elicited (Bradley & Lang, 1999). Studies have found that reaction times for the Emotional Stroop task have moderate to high test-retest reliability (r = .65-.91) (Eide, Kemp, Silberstein, & Nathan, 2002; Franzen, Tishelman, Sharp, & Friedman, 1987). One study to date has directly examined test-retest reliability of the implicit memory using word-stem completion task in a non-clinical population (Meier & Perrig, 2000); however, the test-retest reliability in clinical populations has not been established.

Slide Task Stimulus Materials. Ten standardized *positive images* (e.g., puppies or children playing) and ten *trauma-related images* (e.g., women crying with a figure looming above her) from the International Affective Pictures System (IAPS; Lang, Bradley, & Cuthbert, 1995) were used to elicit psychophysiological activity in the client participants. The images used in the present study have been previously shown to elicit

physiological arousal in a traumatized population (Elsesser, Sartory, & Tackenberg 2004; See Appendix 12 for samples). Standardized trauma-related stimuli have been demonstrated to be particularly potent in eliciting such activity in groups with PTSD (Pole, 2007).

Heart Rate. HR is a measure of the activity of the heart, which is controlled by a combination of the pacemaker and innervation from the sympathetic and parasympathetic nervous systems (Andreassi, 2007; Hassett, 1978). Heart rate is known to increase with sympathetic nervous system activation or parasympathetic nervous system withdrawal or both (Andreassi, 2007). James Long Company ECG leads were placed on the left and right forearms to used continuously record the electrocardiogram from which inter beat intervals were calculated and then converted to heart rate in beats per minute. Heart rate is influenced by breathing (Andreassi, 2007; Hassett, 1978); thus, respiration was controlled for in analyses using HR and reported as necessary. In order to examine parasympathetic influence on heart rate, correlations of HR and RSA were used. Uncorrelated HR and RSA indicate that HR is not under parasympathetic influence.

Respiration. Respiration period and tidal volume were both measured. However, they were only used in the generation of Respiratory Sinus Arrhythmia (see below). Respiration period indexes the time between breaths in seconds, while tidal volume indexes the depth of a breath in arbitrary units (Harver, 2000). Respiration tends to quicken and become shallower during states of anxiety and fear, though tidal volume may increase in fear states as well (Fried, 1994). Like heart rate, respiration is both sympathetically and parasympathetically controlled. Respiration was measured using James Long Company bellows that were fitted snugly around the participant's rib cage.

As the participant inhaled, the bellows expanded and as the participant exhaled, it contracted. The air displaced by the bellows was converted into a digital signal.

Respiratory Sinus Arrthymia (RSA). Respiratory sinus arrhythmia refers to the alteration of heart rate due to breathing (Bernstein, Cacioppo & Quigley, 1993). It is considered a measure of the activity of the myelinated branch of the parasympathetic nervous system (Porges, 1995, 2007), which serves to slow heart rate and return an organism to homeostasis following threat (Andreassi, 2007; Hassett, 1978). Higher RSA indicates more emotion regulation; failure to show elevations of RSA in conditions of threat indicates poor emotion regulation (Porges, 1995, 2007). Though RSA is a measure of myelinated vagal activity, there is no direct measure of unmyelinated vagal activity without pharmacological blockade. However, one may gain a proxy of RSA's influence on heart rate through examining the correlation of HR and RSA. In conditions when HR and RSA are uncorrelated, HR is not under the influence of the myelinated vagal nerve (Sahar et al., 2001). RSA, measured in seconds, was computed by finding the difference in maximum heart rate during inhalation and minimum heart rate during exhalation. Then, minimum and maximum heart rate is computed midpoint in time of each inhalation and exhalation to control for respiration period.

Skin Conductance (SC) Level. SC level indexes transient changes in the skin's ability to conduct electricity. SC is associated with changes in eccrine sweat gland activity in response to arousing stimuli and is primarily mediated by frontal, amygdala and hypothalamic pathways via the sympathetic nervous system (e.g., Williams et al., 2001). However, SC can also reflect changes in parasympathetic activity (Venables and Christie, 1973). Changes in SC are often interpreted as signals of orienting, attention and

affective responses (Harrell, Morris, and Rasayson, 1996) and may also reflect events in the brain of psychological significance and intensity of conscious experience (Hassett, 1978). SC in microSiemens was obtained from the medial phalanges of the middle and index fingers of the left hand using a James Long Company skin conductance coupler.

Selection of Relevant Variables.

Self-Report. For the purpose narrowing the scope of this study, the most relevant symptom subscales were selected for analysis. In addition to PTSD total scores, intrusion, avoidance/numbing and hyperarousal subscales of the PCL were examined separately for the majority of analyses because they relate more specifically to the laboratory measures than the total PCL score. From the BSI, only the depression, anxiety and interpersonal sensitivity subscales were correlated with the lab measures, as these three subscales represent symptoms commonly afflicting trauma survivors (van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005) and specifically tapped by the lab stimulus materials. In addition, because the sample was not selected to be homogenous with respect to symptom presentation or diagnosis, the "worst" degree of psychopathology on any of the nine BSI subscale was examined as a separate index of distress. For example, if a participant reported paranoia as her most elevated area of distress, the score from this subscale was entered as her score for the "worst" subscale.

Laboratory assessment. For the Stroop Task and Word-Stem Completion Task, only stimulus types related to specific hypothesis were utilized in analyses (see below). For comparison of word categories on the Word Stem task, ratios of the number of primed responses to the number of primed words seen were created to account for the different number of words in each category. Similarly, words explicitly recalled were

subtracted from the Word Stem implicit memory scores. For the Slide Task, the first 30 seconds of baseline data were dropped from analyses to provide a more accurate portrayal of "resting" physiology. Exploratory analyses revealed that statistical tests utilizing physiological "reactivity" variables (i.e., baseline physiology subtracted from trauma slide physiological responses) did not yield different results from physiological "activity" analyses (i.e., analyses in which baseline physiology is not subtracted from trauma slide physiological responses). Therefore, because physiological activity may be more intuitive to some readers (e.g., magnitude of physiological activity is reported on the same scale for both baseline and trauma slide), results for physiological "activity" are reported.

Other Considerations. Because small sample size increases the likelihood that outliers may erroneously inflate or deflate statistical findings, boxplots were used to identify outliers. One participant had significantly more potentially traumatic events than other participants; data were analyzed both with and without her included. No differences in results were found when excluding her; thus, results are reported with her included. Similarly, one participant was a bivariate outlier with respect to the Stroop/PTSD symptom change correlation. When this participant was excluded, PTSD symptom changes in relation Stroop Task performance changes became significant. Thus, results for this statistical test are reported with this participant in exclusion.

Analyses that are not guided by specific hypotheses and prior research are not presented in the text, in part to decrease reader fatigue. However, one may refer to the appended tables for analyses conducted on additional variables of interest. For example,

though there are not specific hypotheses regarding many of the positive stimuli utilized in this study, many analyses of positive stimuli are nonetheless presented in the tables.

Data Analysis.

Because a small sample size increases the likelihood that outliers may erroneously inflate or deflate statistical findings, box plots were used to identify outliers. One participant had noticably more traumatic events than other participants; data were analyzed both with and without her included. No differences in results were found after excluding her; thus, results are reported with her included. Similarly, one participant was determined to be a bivariate outlier via scatterplots with respect to the Stroop/PTSD symptom change correlation. When this participant was excluded, PTSD symptom changes in relation Stroop Task performance changes became significant. Thus, results for this statistical test are reported with this participant excluded.

To limit type I error due to multiple statistical tests, the data analysis was divided into primary and secondary tests. Primary tests involved measures with the strongest theoretical and prior empirical justification. Secondary tests involved measures of interest but not as firmly justified by prior research. Analyses that were not guided by specific hypotheses and prior research are not presented in the main text. However, one may refer to the appended tables for analyses conducted on additional variables of interest. For example, though there are not specific hypotheses regarding many of the positive stimuli utilized in this study, many analyses of responses to positive stimuli are presented in the tables.

All hypotheses related to Stroop and symptoms were tested using bivariate correlations of symptom measures and Stroop emotion task performance scores,

partialling out neutral task performance scores. All of the hypotheses related to Word Stem and symptoms were tested using bivariate correlations of symptom scores and the appropriate Word Stem performance scores partialling out neutral task and explicit memory performance scores. All of the hypotheses related to Slide Task reactivity and symptoms were tested using bivariate correlations of the symptom scores with and slide task physiological levels.

Paired-samples t-tests were used to examine changes in Stroop, Word Stem and Slide Task reactivity from pre-therapy to post-therapy. Bivariate correlations between change scores and trauma exposure and dissociation were used to examine factors related to change. Independent samples *t*-tests were used to examine degree of change as related to psychotropic medications and treatment discontinuation. Because it is not statistically advisable to use variables which may represent distinct groups as control variables (Miller & Chapman, 2001), we refrained from adjusting our analyses for these variables. Bivariate correlations were also conducted with the change scores of symptoms and Stroop Task performance, Word Stem Task performance and Slide Task performance.. To test hypotheses regarding the relationship between therapy processes and self-report and laboratory measures, I employed bivariate correlations using the residuals of outcome variables (controlling for pre-therapy measures) and the residuals of therapy processes (controlling for other processes; e.g., trauma-focused SIT process controlling for trauma-focused CBT process and SGM process, and general CBT process controlling for general PD process). When other variables such as demographics and trauma exposure were related to outcome, partial correlations were conducted.

Chapter III

Results

Sample Characteristics.

Demographics. The 27 female clients who completed the first part of the study ranged in age from 18 to 64 years old (M = 38.08, SD = 13.41). Twenty of the clients (74%) were Euro-American; four (15%) were Native American; two (7%) were African American; and one (4%) was South Asian American. Nineteen (80%) identified as heterosexual and the remainder identified as lesbian or bisexual. Three (11%) had not completed high school; four (15%) had completed high school but had not attended college; 13 (47%) had attended some college or completed college; seven (26%) had post-baccalaureate education. Sixteen clients (60%) were taking prescribed psychotropic medications prior to the first assessment. See Table 1 for further details. Two clients were unable to return to the lab to complete the lab-based portion of their second assessment; however, they did complete their post-therapy self-report questionnaires. One additional client was unable to complete any portion of her second assessment because she developed a terminal illness. The 22 therapists who participated in the study were mostly female (91%) and fully licensed (73%). Their theoretical orientations were primarily psychodynamic (41%) or cognitive behavioral (45%). The remainder listed DBT, supportive, or feminist as their primary orientations. Three of the therapists treated more than one (i.e., 2) of the clients. Three therapists did not complete their questionnaires.

Because attrition was small, it was not possible to analyze for differences in the completers versus non-completers

Trauma Exposure. The clients reported experiencing between 5 and 25 (M = 11.2, SD = 5.6) different types of traumatic events during their lifespan, including but not limited to robbery, rape, physical abuse, emotional abuse, and kidnapping. All had experienced some sort of interpersonal violence with 21 (78%) reporting non-sexual physical assaults, 18 (67%) reporting sexual violence, and half the sample reporting both physical and sexual violence. All clients reported that at least one of their assaults was perpetrated by a caregiver or intimate partner. The earliest age reported for a first potentially traumatic incident was under 2 years (reported by 28% of clients), while the latest age reported for a first traumatic incident was 16 years (reported by one participant). The average age of the first traumatic experience was 6.8 years (SD = 5.9). The average age of clients for their most recent traumatic event was 33.73 years (SD = 14.6). All clients reported experiences of trauma prior to adulthood; 23 (85%) reported trauma prior to 14 years of age; 17 (63%) experienced trauma prior to 7 years of age. All but one client reported experiencing traumatic events both before and after age 18. When asked to indicate the number of times that they experienced each event respondents reported between 16 and 2,544 (M = 353.1, SD = 625.2) separate incidents, including emotional abuse, in their lifetime. Excluding emotional abuse, clients reported experiencing between 16 and 1,654 (M = 212.2, SD = 375.7) lifetime traumatic events. See Table 1 for further information.

Initial Psychopathology. Descriptive statistics summarizing the clients' reported levels of psychiatric distress are presented in Table 6. The sample reported significantly

higher PCL, BSI global severity, and DES scores than outpatients in published validation samples (Ruggiero, Del Ben, Scotti, & Rabalais, 2003; Ryan, 2007; van Ijzendoorn & Schuengel, 1996); respectively, $t(417) = 2.48$, $p < .05$, $d = 0.24$; $t(277) = 4.74$, $p < .05$, $d = 0.74$; $t(166) = 3.11$, $p < .05$, $d = 0.48$. Though only 10 clients (37%) reported PTSD symptoms as their most severe symptoms in comparison to the BSI symptom subscales, all clients had PCL scores above the diagnostic cut score for PTSD. Forty-five percent of clients in this sample had DES scores above the cut score recommended for diagnosing Dissociative Identity Disorder (van Ijzendoorn & Schuengel, 1996).

Manipulation checks of Pre-Therapy Laboratory Procedures.

Pre-Therapy Attentional Biases: Stroop Task. Overall, clients named the colors of fewer trauma- and anxiety-related Stroop words than neutral Stroop words in the allotted time (respectively, $t(26) = 3.67$, $p < .001$, $d = 0.91$ and $t(26) = 3.01$, $p < .01$, $d = 0.63$). They did not differ in the number of depression-related Stroop colors named compared to neutral words. See Table 2. Thus, the sample appeared to show an attentional bias for trauma and anxiety-related words that slowed their naming of those categories.

Pre-Therapy Implicit Memory: Word-Stem Completion Task. After clients viewed words with emotional content paired with neutral words that shared the same first few letters, they were more likely to respond to a word-stem prompt with trauma-related ($t(26) = 7.59$, $p < .001$, $d = 2.56$) and anxiety-related words ($t(26)=3.07$, $p < .01$, $d = 0.94$) than matched neutral words, and less likely to respond with positive words than matched neutral words ($t(26) = -1.93$, $p < .1$, $d = -0.43$). Clients also responded with more trauma match words (e.g., words of neutral valence but with the same word stem as the primed trauma words) than other neutral words ($t(26) = -2.19$, $p < .05$, $d = -0.56$). Thus, the

sample showed stronger implicit memory of trauma- and anxiety-related words and less implicit memory of positively-valenced words. The sample also showed stronger implicit memory biases for neutral words that shared stems with trauma words. See Tables 2 and 8.

Pre-Therapy Emotional and Physiological Activity: Slide Task. To verify that clients had the intended responses to the slides, we examined self-reported emotional reactions and the relationship of self-reported emotional responses to physiological activity. On average, clients reported feeling "somewhat," distressed, sad, anxious and disgusted while viewing the trauma slides and "no" or "a little" calmness or safety. See Table 9 for means. Clients who reported feeling calmer and safer during the task had higher RSA throughout the trauma slides and recovery phase (respectively, calm: $r = .39$, $p < .05$; $r = .39$, $p < .05$; safe: $r = .40$, $p < .05$; $r = .43$, $p < .05$). Clients had significantly higher RSA and HR, and lower SCL during the trauma slides compared to the recovery phase (respectively, $t(25) = 6.38$, $p < .01$; $t(25) = 4.60$, $p < .001$; $t(25) = -2.78$, $p < .01$). See Table 2. RSA and HR were significantly correlated during the baseline phase ($r = -.46$, $p < .05$), indicating a myelinated vagal influence on heart rate during this phase of the task. However, RSA and HR were not significantly correlated during the trauma slides and recovery (respectively, $r = -.35$, $p > .05$ and $r = -.28$, $p > .05$), indicating that HR may not have been influenced primarily by myelinated vagal activity during these periods. See Table 9 for means.

Confirmatory analyses. Because there are multiple approaches to analyzing within-subjects designs, all analyses were cross-confirmed with additional methods. Analyses using change scores were conducted using residuals and partial correlations,

and vice versa. The psychotherapy process data were also analyzed utilizing multiple regressions. All methods of analysis yielded nearly-identical results. With respect to physiology, respiration variables were employed as control variables but yielded no different results from those reported here.

Hypothesis 1. Were pre-therapy symptoms related to pre-therapy attentional biases, implicit memory and physiological activity?

Attentional Biases: Stroop Task.

With regard to the measures of primary interest, clients who reported more pre-therapy PTSD intrusion symptoms responded accurately to marginally fewer anxiety-related words and trauma-related words in the Stroop task (r = -.39, p < .1 for both). Pre-therapy PTSD avoidance/numbing and hyperarousal symptom scores were not related to Stroop task performance. Among secondary measures, more severe pre-therapy general anxiety symptoms were significantly related to poorer performance on the trauma-related Stroop lists (r = -.46, p < .05) and marginally related to poorer performance on the anxiety-related Stroop lists (r = -.36, p < .1). The severity of the client's worst problem, dissociation, and depression symptoms were not significantly related to Stroop task performance. See Table 4.

Implicit Memory: Word-Stem.

Among measures of primary interest, more severe pre-therapy PTSD symptoms, particularly intrusion symptoms, were significantly related to more implicit memory for trauma-related words (r = .50, p < .05). More PTSD avoidance/numbing and hyperarousal symptoms were marginally related to more implicit memory for trauma-

related words ($r = .36$, $p < .1$ for both). Among measures of secondary interest, more severe general anxiety symptoms, and more interpersonal sensitivity symptoms were significantly related to more implicit memory for trauma-related words ($r = .51$, $p < .01$ and $r = .43$, $p < .05$, respectively). None of the symptom measures were related to implicit memory for anxiety-related words. See Table 4.

Physiological Activity: Slide Task.

Among measures of primary interest, more severe PTSD avoidance /numbing symptoms but not hyperarousal symptoms were marginally related to lower RSA during the baseline ($r = -.35$, $p < .1$), trauma ($r = -.35$, $p < .1$) and recovery ($r = -.40$, $p < .1$) phases. PTSD symptom severity was not significantly related to heart rate or skin conductance levels during baseline or recovery. Among measures of secondary interest, clients with more severe interpersonal sensitivity symptoms had higher heart rates during all phases of the slide task ($r = .39$, $p < .1$ 5; $r = .39$, $p < .1$; and $r = .47$, $p < .05$ for baseline, trauma and recovery, respectively), and lower RSA ($r = -.45$, $p < .05$; $r = .-38$, $p < .1$; and $r = -.36$ $p < .1$ for baseline, trauma and recovery, respectively) . More severe anxiety was marginally related to lower RSA ($r = -.38$, $p < .1$; $r = -.37$, $p < .1$; and $r = -.39$, $p < .1$ for baseline, trauma and recovery, respectively). Dissociation and depression were not related to any measure of physiological activity. See Table 5.

<u>Hypothesis 2:</u> Did self-reported symptoms, attentional biases, implicit memory and physiological activity change from Pre to Post-Therapy?

Psychiatric Symptoms.

Among measures of primary interest, clients reported significant improvement in their area of most severe pre-therapy distress ($t(24) = 2.60$, $p < .05$, $d = .47$). In other words, if a woman reported that anxiety was what was troubling her the most, she was likely to improve in anxiety. Clients also reported marginally fewer hyperarousal symptoms ($t(24) = 1.95$, $p < .1$, $d = .31$) and avoidance symptoms ($t(24) = 1.90$, $p < .1$, $d = .31$) after therapy. They did not report any significant change in intrusion symptoms, depression, anxiety, or interpersonal sensitivity. Among measures of secondary interest, clients showed no significant changes in somatization, obsession-compulsion, psychoticism, paranoia, hostility, or phobic avoidance. See Table 6.

Clients who had fewer total traumas and had significantly less change in avoidance/numbing ($r = -.47$, $p < .05$) and hyperarousal symptoms ($r = -.50$, $p < .05$), and marginally less change in intrusion ($r = -.43$, $p < .1$) and depression symptoms ($r = -.35$, $p < .1$). Clients who had more pre-therapy dissociation had marginally less change in avoidance/numbing ($r = -.38$, $p < .1$), hyperarousal ($r = -.44$, $p < .1$) , and depression ($r = -.39$, $p < .1$) symptoms. See Table 11.

Change in Attentional Biases: Stroop Task.

Clients showed significant improvement in Stroop task performance for trauma- ($t(22)= 3.00$, $p < .01$, $d = -0.56$) and anxiety-related ($t(22)= 2.30$, $p < .05$, $d = -0.43$) words . Performance on the neutral Stroop task did not change from pre- to post-therapy, indicating that changes were not related to practice. See Table 7. Despite the

improvement in Stroop performance, participants still performed worse on the Trauma Stroop than on the Neutral Stroop, ($t(22)= 3.65$, $p < .001$, $d = 0.69$). See Table 10.

Clients with lower pre-therapy dissociation scores showed significantly greater improvement on the anxiety Stroop task ($r = -.40$, $p < .05$). More educated subjects showed more change on the trauma Stroop task ($r = .55$, $p < .05$) and less change on the neutral Stroop task ($r = -.41$, $p < .05$). See Table 11.

Change in Implicit Memory: Word-Stem.

Among measures of primary interest, clients showed significantly decreased implicit memory for trauma-related words from pre- to post-therapy ($t(22)= 3.57$, $p < .01$, $d = 0.52$), but no differences in neutral-word or anxiety-related word implicit memory. See Table 8. However, despite improvement in trauma-related implicit memory, participants still had more implicit memory for trauma-related than neutral words post-therapy ($t(22)= 2.63$, $p < .05$, $d = 1.21$). See Table 10. Among measures of secondary interest, clients showed significantly increased implicit memory for positive words from pre- to post-therapy ($t(22)= 2.12$, $p < .05$, $d = 0.26$). See Table 8.

Clients who were older when they experienced their first traumatic event showed a significantly greater pre-to-post therapy decrease in implicit memory for trauma-related words ($r = .53$, $p < .05$). See Table 11.

Change in Emotional and Physiological Activity: Slide Task.

Clients reported marginally less pre-to-post therapy subjective anxiety ($t(22)= 1.84$, $p < .1$, $d = 0.44$) and more sense of safety ($t(22)= 1.75$, $p < .1$, $d = 0.46$) while

viewing the trauma slides. Clients' Heart Rate, RSA and SCL did not differ from pre-to-post therapy. See Table 9. The earlier pattern of increased HR, RSA and SCL from the trauma slide phase to recovery still held; however, participants now showed increased SCL from baseline to the trauma slide phase. See Table 10. There was a trend for heart rate and RSA to be more inversely correlated while viewing the trauma slides post-therapy (r = -.67, p < .05) than while viewing the trauma slides pre-therapy (r = -.35, p > .05). Older clients had greater increases in skin conductance during the recovery period. See Table 12.

Hypothesis 3. Were changes in symptoms related to changes in attentional biases, implicit memory and physiological activity?

Relationship of symptom change to attentional bias change.

Among variables of primary interest, changes in overall PTSD symptoms were significantly related to changes in anxiety-related Stroop performance (r = .65, p > .01), and marginally related to changes in trauma-related Stroop performance (r = .44, p > .1). Clients who improved in intrusion symptoms performed significantly better on the trauma-related (r = .55, p > .05) and anxiety-related (r = .73, p > .01) Stroop task. Clients who improved in hyperarousal symptoms also improved on the anxiety-related Stroop task (r = .81, p > .01). Changes in avoidance/numbing symptoms were marginally related to changes in anxiety-related Stroop task performance (r = .49, p > .1). Change in worst symptom cluster was not related to changes in Stroop task performance. See Table12. Among variables of secondary interest, changes in dissociation were significantly related

to changes on the trauma-related Stroop task (r = .63, p > .05). Changes in anxiety symptoms were marginally related to changes on the anxiety-related Stroop task (r = .41, p > .1). Changes in depression symptoms were not related to changes in the depression-related Stroop task performance. See Table 12.

Relationship of symptom changes to implicit memory changes.

Clients who had more improvements in hyperarousal symptoms also had significantly greater decreases in implicit memory bias for trauma-related words (r = -.54, p > .05). Clients who improved more in avoidance/numbing symptoms also had marginally more improvement in implicit memory for anxiety-related (r = -.43, p > .1) and trauma-related (r = -.37, p > .1) words. No other changes in symptoms were significantly related to changes in variables of interest on the Word Stem Task. See Table 12.

Relationship of symptom changes to physiological activity changes.

Among measures of primary interest, pre-to-post therapy decreases in intrusion symptoms were marginally related to pre-to-post therapy decreases in HR activity during trauma slides (r = .37, p > .1) and to pre-to-post therapy increases in RSA during all phases (r = -.42, p > .1; r = -.44, p > .1; and r = -.44, p > .1 for baseline, trauma and recovery, respectively). Pre-to-post therapy decreases in avoidance symptoms were marginally related to pre-to-post therapy decreases in SCL during recovery (r = .42, p > .1). Among measures of secondary interest, clients who reported pre-to-post therapy decreases in interpersonal sensitivity had significantly pre-to-post therapy increases in

RSA levels during all phases of the slide task (r = -.56, -.57, and -.57, $p < .05$ for baseline, slide and recovery, respectively) and marginal pre-to-post therapy increased HR levels during the recovery period (r = -.38, $p < .1$) . Clients who had pre-to-post therapy decreases in dissociation had marginal pre-to-post therapy decreases in SCL during the recovery phase (r = .38, $p < .1$). Clients who had pre-to-post therapy decreases in anxiety had marginal pre-to-post therapy increases in RSA across all phases (r = -.43, -.45, and -.45, $p < .1$ for baseline, slide and recovery, respectively) and marginal pre-to-post therapy decreases in SCL (r = .43, p < .1) and HR during the recovery phase (r = .43, $p < .1$ for both). Changes in depression were not related to physiological changes. See Table 13.

Hypothesis 4. Are changes in symptoms, attentional biases, implicit memory and physiological arousal related to therapy processes?

Therapy Process Descriptives. Trauma-related work on shame/guilt and meaning therapy techniques were utilized more than stress-inoculation therapy techniques ($t(21)$ = 2.85, $p < .05$, d = 0.92) and trauma-focused prolonged exposure techniques ($t(21)$ = 5.44, $p < .01$, d = 1.14). The therapies did not significantly differ in their utilization of general psychodynamic therapy and general cognitive behavior therapy techniques ($t(21)$ = 1.57, $p > .05$, d = 0.23). Working alliance was not significantly correlated with any technique. Initial symptom severity, trauma exposure, and education level were not associated with any specific psychotherapy techniques or with working alliance. The degree to which each therapy type was used is listed Table 3. A list of all processes associated with each therapy type is in Appendix 9.

Relationship of Processes to Changes in Symptoms. Among measures of primary interest, greater presence of trauma-related work on shame/guilt and meaning therapy process was associated with significantly lower residual post-therapy overall PTSD symptoms (r = -.53, p < .05), as well as intrusion (r = -.54, p < .05), avoidance/numbing (r = -.47, p < .05), and anxiety symptoms (r = -.51, p < .05). Trauma-related work on shame/guilt and meaning therapy process was marginally related to lower post-therapy hyperarousal (r = -.43, p < .1), depression and interpersonal sensitivity symptoms (r = -.37, p < .1 for both). Greater presence of stress inoculation therapy process was significantly related to lower residual post-therapy overall PTSD symptoms and intrusion symptoms (r = -.52, p < .05 for both), and marginally related to lower post-therapy hyperarousal (r = -.43, p < .1) and depression symptoms (r = -.37, p < .1). The level of trauma-focused PE process was unrelated to any measures of post-therapy symptoms. Controlling for trauma exposure and pre-therapy dissociation variables did not change any of the relationships of therapy process to symptoms. See Table 14.

Among measures of secondary interest, greater levels of general psychodynamic therapy process were significantly associated with lower residual post-therapy avoidance/numbing symptoms (r = -.59, p < .05) and marginally associated with lower residual post-therapy overall PTSD (r = -.48, p < .1), intrusion (r = -.47, p < .1), hyperarousal (r = -.40, p < .1), and interpersonal sensitivity symptoms (r = -.38, p < .1). Greater levels of general cognitive behavioral therapy process were significantly associated with higher residual post-therapy dissociation symptoms (r = .64, p < .01) and marginally associated with lower post-therapy residual avoidance/numbing symptoms (r = -.48, p < .1). Working alliance was not related to changes in symptoms. See Table 14.

Controlling for trauma exposure and pre-therapy dissociation variables did not change any of the relationships of therapy process to symptoms.

Relationship of Processes to Changes in Stroop. Among measures of primary interest, more trauma-related work on shame/guilt and meaning therapy process was marginally associated with better residual post-therapy anxiety-related Stroop performance ($r = .39$, $p < .1$) when controlling for total number of traumatic events. More trauma-focused PE process was marginally associated with worse residual post-therapy anxiety-related Stroop performance ($r = -.37$, $p < .1$). Stress inoculation therapy was not related to changes in Stroop performance. Among measures of secondary interest, general psychodynamic therapy and CBT process were not related to changes in Stroop performance. See Table 14. Other than as reported, controlling for number of trauma exposures, dissociation and education level did not affect these relationships.

Relationship of Processes to Changes in Word Stem. Among measures of primary interest, more SIT process was marginally related to lower residual post-therapy implicit memory for anxiety-related words ($r = -.38$, $p < .1$). Trauma-related work on shame/guilt and meaning therapy techniques and trauma-focused PE techniques were not related to post-therapy Word Stem. Controlling for trauma exposure, dissociation and education level did not change these relationships. Among measures of secondary interest, more general CBT process was marginally associated with lower residual post-therapy implicit memory for trauma words ($r = -.46$, $p < .05$), but not with any other categories of Word Stem. When controlling for education level, general psychodynamic therapy process was significantly related to lower residual post-therapy implicit memory for anxiety-related

words (r = -.58, p < .01). See Table 14. Other than as mentioned, controlling for number of trauma exposures, dissociation and age did not change any of these relationships.

Relationship of Processes to Changes in Slide Task. Among measures of primary interest, more trauma-related work on shame/guilt and meaning therapy process was significantly related to higher residual post-therapy RSA while viewing the trauma slides and to higher residual post-therapy RSA during recovery phase (r = .46, p < .05 for both), but was not related to baseline RSA. More trauma-related work on shame/guilt and meaning therapy process was marginally related to lower residual post-therapy skin conductance during baseline (r = -.41, p < .1), but not during other phases. Trauma-related work on shame/guilt and meaning therapy process was not related to any measure of heart rate. More stress inoculation therapy process was marginally related to higher residual post-therapy RSA while viewing the trauma slides (r = .41, p < .1), but not to any measure of skin conductance or heart rate. Trauma-focused PE techniques were marginally related to lower residual post-therapy trauma slide RSA (r = -.37, p < .1). Controlling for number of trauma exposures, dissociation and age did not change any of these relationships. See Table 14.

Among measures of secondary interest, more general psychodynamic therapy process was related to marginally higher residual post-therapy RSA during baseline (r = .40, p < .1). General psychodynamic therapy was not related to RSA during any other phase, or to HR or SCL. More general CBT process was related to significantly higher residual post-therapy heart rate (r = .47, p < .05) during recovery. More general CBT process was also related to marginally higher residual post-therapy RSA during the trauma slides (r = .37, p < .1). General CBT process was not related to physiology during

any other phase. Higher working alliance was correlated with significantly higher residual post-therapy skin conductance during the recovery phase ($r = .-47$, $p < .05$). See Table 14. Controlling for number of trauma exposures, dissociation and age did not change any of these relationships.

Other factors associated with change.

Presence vs. absence of psychotropic medications was not related to any changes, symptoms or lab responses; nor was continuing vs. discontinuing therapy after the conclusion of the study.

Chapter IV

Discussion

At the outset of this study, participants had significant psychiatric distress, attentional biases for trauma- and anxiety-related material, greater implicit memory for trauma- and anxiety-related material, and physiological dysregulation in response to trauma-related slides. Participants changed slightly from pre- to post-therapy with respect to symptoms and physiology, but changed more with respect to attentional biases and implicit memory. General psychodynamic and trauma-related work on shame/guilt and meaning therapy processes were most often associated with improvement. Treatments featuring elevated levels of these processes achieved greater improvement in PTSD symptoms, depression and anxiety symptoms, attentional biases, and physiological levels (i.e., skin conductance and RSA). Trauma-focused stress-inoculation therapy process was also associated with improvements in PTSD symptoms, anxiety-related implicit memory and with increases in heart rate during the slide task. In contrast, trauma-focused PE process was not associated with reported symptom changes, but was negatively correlated with laboratory change.

This all-female sample had severe and repeated exposure to potentially traumatic events throughout their lifespan. Their mean number of potentially traumatic events was uncommonly high, though no special effort was made to recruit participants with any more than one experience of interpersonal violence. It is likely, however, that the high

subject payment fee attracted low income or unemployed participants. Indeed, several participants in the study had or were seeking designated disability due to PTSD or related disorders. Thus, people whose symptoms were so severe as to leave them in dire financial straits were probably more likely to be clients in this study. Though one might properly protest that fiscally-marginalized women are under-represented in the treatment literature (e.g., Spinazzola, Blaustein and van der Kolk, 2005), one cannot then naturally assume that research pertaining to this group is somehow more representative of the experiences of women. These data should therefore be interpreted with an eye to the particularities of this highly-trauma-exposed sample.

Consistent with prior literature, participants in this study evidenced fewer responses to both trauma-related (Foa et al., 1991; McNally, English, & Lipke, 1993; Paunovic et al., 2002) and anxiety-related (Buckley, Blanchard, & Hickling, 2002; Field et al., 2001; Vythilingam et al., 2007) words as compared to neutral words in the pre-therapy Stroop task. The emotional Stroop is considered a task of capacity for cognitive control under taxing conditions (Kanagaratnam & Asbjornsen, 2007; McNally et al., 1993). FMRI studies have indicated activation of the anterior cingulate cortex during the Stroop task in normal subjects, but de-activation in PTSD subjects (Bremner et al., 2004; Shin et al., 2001). The anterior cingulate has been implicated in impulse inhibition and is associated with attentional fatigue. One interpretation of my Stroop findings is that the presentation of trauma- and anxiety-related stimuli interfered with the clients' efforts to focus on the task at hand. Participants may have had difficulty "filtering out" trauma-related stimuli despite their efforts to focus on the color-naming task. Indeed, as in other studies (e.g., McNally et al., 1993), participants frequently reported during post-

experiment debriefing that they could not ignore the trauma and anxiety words or get them of their head even after the task had ended. Taken together, these data provide evidence that these trauma survivors were hyper-attentive to threatening stimuli.

Also consistent with previous studies (Amir, McNally, & Wiegartz, 1996; Michael et al., 2005), clients more often had implicit memory for trauma and anxiety words than with the matching neutral words from these categories. These findings remained significant even when controlling for words which participants explicitly recalled seeing, indicating that the influence of these stimuli was out of the range of awareness for participants. People who do not explicitly recall trauma-related stimuli may be limited in their understanding of how their traumatic past may continue to impact them in terms of environmental triggers. The impact of trauma stimuli appears to also impact clients' perceptions of neutral stimuli. Clients demonstrated more implicit memory for the trauma-match words (e.g., the neutral words that shared the same first letters as trauma words) than other neutral words. This finding may indicate that neutral material that shares features with traumatic material may become more prevalent in the subconscious memories of trauma survivors even when no effort was made to explicitly link the neutral and traumatic material. One other study to date has documented similar findings (Michael & Ehlers, 2007). When shown neutral pictures immediately before either trauma-related pictures or other neutral pictures, participants showed evidence of perceptual priming for the neutral material preceding traumatic material, but not for neutral material preceding other neutral material. Both findings may enhance our understanding of the seeming unpredictability of intrusive recollections and emotional lability in trauma survivors. However, this interpretation must be regarded with caution

because my data do not directly show that trauma-matched neutral stimuli actually resulted in distress or intrusive memories in my sample.

Finally, clients were *less* likely to remember positive words than positive-matched neutral words. One other study to date has found evidence for suppression of primed positive material in trauma survivors (Litz et al., 2000). While the trauma literature has begun to recognize that a loss of positive affect has a significant impact on quality of life in trauma survivors (Litz, 1992), cognitive biases against positive affect has not been explored. Positive stimuli may represent a "drain" upon attentional resources under the perceived threat of the laboratory situation. The restoration of positive affect, and not simply the amelioration of distress, is a significant and worthwhile goal of therapeutic intervention. This apparent bias against remembering positive stimuli may be an important target of intervention in survivors of interpersonal violence.

The clients reported negative emotions in reaction to the trauma slides suggesting that they served as a potent subjective trauma cue. On the other hand, the general pattern of physiological findings showed decreased physiological activation during the trauma slides followed by rebounding during the post-slide recovery phase. The pre-therapy physiological findings might be best explained in light of Polyvagal Theory (Porges, 1995, 2007). Correlated HR and RSA during baseline indicates that there was a myelinated vagal influence on HR. Less correlated HR during the trauma slides indicates that the myelinated vagus was not primarily responsible for a lack of increase in heart rate from baseline to trauma slides. Paired with the finding that SC was lower during the trauma slides, these data are consistent with unmyelinated vagal activity, or passive threat responses to the trauma-related slides. These interpretations are consistent with newer

findings in the physiology and trauma literature, which indicates that highly dissociative samples may have lower, rather than higher, physiological arousal in response to trauma reminders (Griffin, Resick, & Mechanic, 1997; Halligan, Michael, Wilhelm, Clark, & Ehlers, 2006; Pole et al., 2005).

Pre-therapy symptoms were related to laboratory assessment findings.

Turning now to a discussion of the main hypotheses, the findings relating specific classes of pre-therapy PTSD symptoms with Stroop performance were important for a few reasons. First, the finding that hyperarousal symptoms were not related to Stroop task performance contradicts earlier theories suggesting that Stroop performance indexes hyperarousal (Fox, 2001; Woodfield, Jones, & Martin, 1995). Second, because avoidance symptoms were not related to Stroop task performance, we cannot conclude that Stroop performance was blocked by effortful avoidance of distressing stimuli.

Intrusion symptoms were related to increased implicit memory for trauma stimuli in the word-stem task suggesting that such symptoms may be linked to subconscious memories of trauma-related material. Though avoidance symptoms only reached marginal correlation with implicit memory, this near finding is consistent with psychodynamic theory, which assumes that avoided stressful material can strongly affect behavior and symptoms. Experimental data have demonstrated that suppression of disturbing thoughts manifests in sustained affect (Cortina & Liotti, 2007; Westen, 1998). Perhaps the clients avoid traumatic stimuli in their day-to-day lives because of their susceptibility to subconscious recollection of traumatic materials, which may leave them feeling chronic distress which they escape through avoidance. My finding that anxiety symptoms were associated with enhanced implicit memory for trauma-related words

supports this explanation. Alternatively, perhaps avoidance prevents people from integrating their encounters with traumatic material, causing their memories to persist in an "unprocessed" form. These complementary hypotheses may create cyclical avoidance patterns which are consistent with contemporary theories of PTSD symptom maintenance (Foa & Kozak, 1986).

In apparent contrast with the majority of the literature (Pole, 2007), PTSD symptoms were not related to an overall increase in heart rate in response to standardized trauma cues. This non-finding may be due to the heterogeneity of the sample with respect to physiological reactivity and comorbidity; or may be due to restricted range within PTSD symptoms in the sample. Indeed, studies reporting greater HR responses in PTSD have typically contrasted PTSD patients with non-PTSD patients. All clients in this study met probable criteria for PTSD. In addition to heart rate, respiratory sinus arrhythmia (RSA) seemed to be an important correlate of psychopathology in this sample in that both PTSD and interpersonal sensitivity symptoms were related to lower RSA. The trauma literature has only recently begun to focus on RSA as an index of the pathophysiology of trauma because of its potential role in failing to "reign in" the sympathetic nervous system (Hopper, Spinazzola, Simpson, & van der Kolk, 2006; Sack et al., 2004).

Pre- to Post-Therapy Changes

Overall, participants reported modest decreases in PTSD symptoms, with most improvements occurring in hyperarousal symptoms. The relative lack of progress in reducing PTSD may be related to the high levels of trauma exposure and dissociation observed in this sample or due to the relatively short treatment time for chronic symptoms. Clients who reported more pre-therapy dissociation and who had experienced

more trauma types showed less improvement in symptoms. Dissociation may blunt the positive effects of therapy by preventing clients from fully experiencing their emotions during sessions. Dissociation thus appears to be a candidate for intervention in order to facilitate further change.

Whereas pre-to-post therapy changes in reported symptoms were modest, performance on all of the emotion-related Stroop tasks improved significantly. Moreover, the absence of changes in neutral Stroop performance suggests that the emotional Stroop improvement was not simply a result of mastery of the task, but rather reflects an increased ability for participants to allocate their attention to a mildly demanding, emotionally-valenced cognitive task. Though a non-treatment comparison group is not available to confirm the cause of changes, these changes may suggest that therapy is associated with decreased attentional biases for emotionally-relevant material. This would be consistent with claims that trauma-oriented therapy targets self-regulation (e.g., Cloitre, Miranda, Stovall-McClough, & Han, 2005; Linehan et al., 1994). Similar to the self-report results, greater pre-therapy dissociation was associated with less Stroop improvement. This result may be explained by findings showing that brain regions normally activated during the Stroop (Bremner et al., 2004; Swick & Jovanovic, 2002) are disrupted by dissociation (Frewen & Lanius, 2006; Spiegel, 1991).

Clients also had less implicit memory for trauma words at post-therapy as compared to pre-therapy. This change may indicate that trauma stimuli became less compelling to the clients and therefore less likely to surface during an implicit memory task. Alternatively, decreases in implicit memory for trauma stimuli may represent a shift from unconscious to conscious recollections of trauma stimuli. Psychodynamic

theory and other information processing theories suggest that significant material which is warded off from consciousness (Cortina & Liotti, 2007; Geraerts, Merckelbach, Jelicic, & Smeets, 2006; Oldenburg, Lundh, & Kivista, 2002; Szentagotai & Onea, 2007) is likely to manifest behaviorally. For participants who opened Pandora's Box for the first time in their lives and are now talking about their trauma on a regular basis, the process of speaking openly about a long-held secret may parallel the process of memory shifting from implicit to explicit.

Unlike the other lab measures, physiology was mostly stable over time, with a few notable exceptions. Heart rate and RSA were correlated during post-therapy but not pre-therapy, indicating that heart rate was influenced by myelinated vagal activity post-therapy. Increased parasympathetic activity constitutes an improvement in physiological activity, as it is linked to one's ability to regulate emotions (Austin, Riniolo, & Porges, 2007; Porges, 2007). The diversity of the pathophysiology in the sample may have increased the difficultly of detecting physiological changes by creating excessive noise in the desired signal as some pathologies drove physiology in one direction and other pathologies drove physiology in the opposite direction. This interpretation is consistent with some theories that discuss PTSD as characterized by oscillations or subtypes of over-aroused people and numb, under-aroused people (Ford, 2005; Horowitz, Hersen, & Bellack, 1999; Horowitz, Milbrath, Ewert, & Sonneborn, 1994; Pole, 2007). This supposition indicates that a statistical analysis in which some participants improved through decreasing physiological arousal while others improved through increasing physiological arousal would not be detected by correlations and change scores.

Overall, it is of note that few changes occurred with respect to symptoms and physiology. Most published clinical trials of treatments for trauma survivors have found significant symptom changes in the time frame utilized in this study (e.g., Cloitre, Koenen, Cohen, & Han, 2002; Foa et al., 2005). It is possible that symptoms changed little because of the degree of traumatization and dissociation within the sample, or because of the differences between the therapeutic techniques employed by therapists and the techniques reported in clinical trials. Another possibility relates to the fact that approximately half of the sample continued therapy beyond the duration of the study. Some researchers have argued that a briefly-defined duration of therapy with a known ending date serves to accelerate the therapeutic process (Levenson, Butler, & Beitman, 1997). Perhaps an open-ended therapy structure slowed the change process for some participants, though the data do not support this interpretation. Despite the small changes in symptoms and physiology, participants did evidence change in attentional biases and implicit memory. Perhaps changes in attention and memory lay the groundwork for change to occur at the level of symptom manifestation.

The relationship between objective and subjective measures of change

For the most part, self-reported symptoms showed concordant pre-to-post therapy change with their corresponding lab measures. Changes in PTSD symptoms paralleled changes in attention and memory, with which they were first associated. These findings support the view that the lab measures utilized in this study indexed important processes underlying PTSD symptoms. However, the modest size of these correlations indicates that changes in lab-measured processes do not directly translate into changes in self-reported symptoms. Furthermore, PTSD symptom changes were not related to changes in

physiology. It is possible that biology may be more resistant to change than cognitive and self-report measures because traumatization occurred at critical early periods of physical, neurological and emotional development for much of this sample (Schore, 2001). Thus, while people may find improved ways of coping and lessening their exposure to PTSD symptoms, survivors of early life trauma may not be able to change their concordant physiology in a short period of time. This finding fits with other data in which asymptomatic police cadets with early trauma exposure have different physiological responses than those without early trauma exposure (Pole et al., 2007).

The relationship between psychotherapy processes and therapy outcomes

The findings on the relationship between therapy process and outcomes suggest that psychodynamic, shame, guilt and meaning-focused, and stress-inoculation therapy techniques were most helpful to this sample of survivors of interpersonal violence. In contrast to prior literature that strongly recommends prolonged exposure (PE) for the treatment of trauma-related symptoms (Foa, Keane, & Friedman, 2003; Hamblen, 2008; NICE, 2005), PE process was either not associated or negatively associated with may of the trauma-related outcomes assessed in this study. It is important to remember that clients did not receive a fully manualized version of any treatment, but rather a "mix and match" of a variety of treatments (e.g., participants may have received a large degree of psychodynamic process mixed with a small degree of cognitive-behavioral processes)

These findings lead one to question what elements of psychodynamic therapy, shame and guilt focused therapy, and stress inoculation therapy may be most related to change. Psychodynamic therapy has been criticized for its lack of focusing on specific symptoms (Blatt & Auerbach, 2003; Lazarus, 1990; Schmideberg, 1977). Thus, it is

somewhat ironic that psychodynamic processes were associated with symptom reductions. Perhaps it is indeed the fluid nature of psychodynamic therapy, resulting in individualized treatment, that allowed it to address a spectrum of client concerns. Similarly, an approach which incorporated a broad range of emotions and meaning were related broadly to symptom improvements. These finding highlights the potential of both general psychodynamic and broadly emotionally-focused processes to elicit symptom reductions. The relationship of therapy processes to objectively-measured changes may provide some explanation of the symptom reductions associated with psychodynamic processes.

Psychodynamic therapy emphasizes awareness of unconscious activity, memory reconstruction and meaning-making (Horowitz, 1976; Krupnick, 2002). These processes may help clients to become more aware of their reactions to the traumatic event. With this new awareness, clients may be able to better regulate their reactivity to stressful stimuli. For example, processes emphasizing awareness of unconscious activity and memory may have been part of the active elements in decreasing attentional biases and implicit memories of anxiety-related stimuli. Processes such as meaning-making and memory reconstruction of traumatic events may have allowed participants to appropriately "categorize" trauma-related word stimuli as not presenting actual threat of harm. Clients may have become more able to clarify the boundaries of their traumatic experiences, rather than attributing threat to all stimuli, once they have found a way to make sense of their experiences.

General psychodynamic processes also use the therapeutic relationship to achieve corrective emotional experiences. These experiences might provide clients with the

opportunity to both examine their other relationships and to engage in a relationship which "breaks the mold" of previously-abusive experiences. Clients may find that their negative feelings may be expressed and tolerated by their therapist in a safe relationship that allows the client to engage in more self-examination. The overall tenor created by explicit attention to the therapeutic interaction may allow for more relaxation and lower overall physiological activity. Indeed, the psychodynamic therapy was related to lower post-therapy skin conductance levels, which may reflect greater decreases in chronic anxiety (Bond, James, & Lader, 1974). The findings of lower interpersonal sensitivity and higher physiological stress regulation (RSA) associated with psychodynamic processes may be attributable to the psychodynamic emphasis on the therapeutic relationship. Higher RSA is thought to reflect better relational functioning (Porges, 2003), may in turn result in lower interpersonal distress. This data is consistent with other evidence which suggests that lower-functioning patients benefit from interpretations pertaining to the therapeutic relationship (Hoglend et al., 2006). None of this is to say that CBT cannot create conditions in which a client feels safe, accepted and reflective. However, trauma-focused prolonged exposure (PE) typically evokes intense negative affect such as fear and anxiety to facilitate habituation to those very emotions (Foa et al., 2005), and in the case of this study, resulted in decreases in RSA.

Taken together, these process outcome correlations imply that psychodynamic approaches, as well as approaches which focus on shame, guilt and meaning may warrant greater attention than they have currently been receiving. The treatment guidelines of the International Society of Traumatic Stress Studies (Foa, Keane and Friedman, 2000) list psychodynamic therapy as a treatment meriting further research but instead list CBT as

the par excellence of trauma interventions. These findings also speak to the difference in general versus trauma-specific therapy. The fact that general therapy processes were less related to change than trauma-focused techniques indicates that specific trauma-focused techniques are important to consider for trauma survivors.

As expected, stress inoculation therapy (SIT) process was significantly related to decreases in symptoms, anxiety-related implicit memory and increases in physiological stress regulation (RSA). Stress inoculation, which relies heavily upon relaxation techniques, focuses on helping people to attend to triggers and trauma cues in the environment, and on increasing coping and relaxation skills. Thus, decreases in indices of anxiety (anxiety-related implicit memory) and increases in emotion regulation (RSA) are consistent with the goals of SIT processes. The level of dissociation in this sample may have played a part in the effectiveness of SIT. In particular, specific emphasis on recognizing triggers may block a proclivity towards dissociation, which may manifest in corresponding physiological and emotional dysregulation. Similarly, the use of relaxation training and guided imagery may have harnessed the skills of dissociative patients, who are by definition capable of deep absorption in internal states (Amdur & Liberzon, 1996). These broader skills may have been especially helpful to participants whose symptom presentations spanned multiple diagnoses. Other preliminary studies have found that relaxation training is beneficial to dissociative patients (Benningfield, 1992; Frueh, de Arellano, & Turner, 1997; Levin & Spauster, 1994). Given that SIT arises out of the cognitive-behavioral tradition, it is not surprising that the changes in symptoms and implicit memory were similar for SIT processes and general CBT processes. Perhaps the augmentation of general CBT with SIT processes would help to address the increased

dissociation and heart rate associated with general CBT as found in this sample. SIT contrasts with trauma-focused PE (as both are defined in this study) in that SIT provides a set of coping skills for tolerating distress to contain it, whereas trauma-focused PE attempts to decrease distress through habituation and exposure via evocation of distress.

Given the dominance of prolonged exposure in the trauma therapy literature, the absence of notable improvements as related to trauma-focused PE processes merit exploration. A likely explanation may lie with the characteristics of this sample as compared with characteristics of other treatment-study samples. As noted by Spinazzola, Blaustein and van der Kolk (2005), a large proportion of clients in community treatment settings would not qualify for randomized treatment studies, because of dissociation, multiple diagnoses, or otherwise complex or high-risk presentations. This study, however, had very few rule-outs; indeed, no participant was turned away because they were too symptomatic. Thus, the participants in this study may have had significantly more complex and severe psychopathology than might be responsive to CBT-prescribed processes as defined in this study (Courtois, 2004; Green et al., 2006; Michelson et al., 1998; van Minnen et al., 2002; Zayfert et al., 2005). In particular, dissociation, which was prevalent in the sample, may serve as a means of avoidance which circumvents the ability of prolonged exposure techniques to provide an opportunity for habituation (Ladwig et al., 2002). In other studies, dissociation has impeded progress with trauma-focused PE (Michelson et al., 1998; Rufer et al., 2006). As has been posited by many clinicians and some research (Zayfert et al., 2005), trauma-focused PE, which addresses trauma more directly than psychodynamic techniques, may have the potential to overwhelm someone who is already functioning poorly. Indeed, trauma-focused PE process was related to

decreased RSA and increased attentional biases for anxiety reminders, indicating deterioration rather than improvement with respect to self-regulation.

In this critique of trauma-focused PE, several important considerations are of note: first, participants whose therapy processes were predominantly prolonged exposure did not differ from those whose therapy processes were predominantly psychodynamic or stress inoculation-based with respect to dissociation, symptom severity of other pre-therapy measures. Thus, one cannot assume that a failure of improvement associated with trauma-focused PE processes occurred because such processes were employed with more "difficult" clients. Second, though trauma-focused PE processes did not seem to significantly aid participants in this study, one cannot conclude that prolonged exposure therapy would not ever be helpful to them. Indeed, several models of "phase-based" treatments for trauma focus on developing alliance and coping skills before closely examining traumatic events (e.g., Levitt, Malta, Martin, Davis, & Cloitre, 2007).Third, this study did not compare manualized PE to other manualized forms of therapy. Perhaps prolonged exposure is only effective under conditions in which it is the sole form of treatment, or in which its application is especially structured or the therapists are well trained in the method. Indeed, Foa and Rothbaum (1998) argued that some techniques might deter the effectiveness of trauma-focused PE. For example, progressive muscle relaxation may be employed as a means of distracting clients from the task of fully addressing traumatic memories. Finally, it is of note that general CBT processes were related with symptom improvements on many fronts, as were SIT processes, which are a subtype of CBT. These findings may indicate that the more structured therapeutic approach associated with CBT may be beneficial to clients similar to the ones in this

sample, while the trauma-focused PE processes such as emphasis on cognitive distortions and repeated exposure to reminders may be less helpful to clients similar to the ones in this study, clients whose histories and symptoms are more severe than participants in most treatment research (Spinazzola, Blaustein, & van der Kolk, 2005). Thus, further studies of how both general and trauma-focused PE functions are warranted, with particular attention to clients of varying degrees of symptom severity and trauma exposure.

The absence of findings related to working alliance is in contrast with other research (Clemence et al., 2005; Cloitre, Chase Stovall-McClough, Miranda, & Chemtob, 2004; Fenton et al., 2001). One possibility may be that alliance may be artificially inflated due to reporting biases in this study. It is possible that people as severely traumatized as the ones in this study may have formed less deep bonds with their therapists than less traumatized people might, in part due to difficulties with trust related to victimization. However, clients may have been hesitant to report negative feelings towards their therapists. Alternately, perhaps the simple act of talking about traumatic events was more powerful than to whom participants were talking. Perhaps factors related to alliance might bear more significantly in long-term treatments with trauma survivors. How alliance factors into treatment with severely traumatized patients, as opposed to more typical patients, is an area for future exploration.

Limitations

This study is limited in several ways. First, though the laboratory assessments increased the objectivity of symptom assessment, the treatments were not under experimental control. Further, the clients were not randomized to specific treatment

types. Thus, one cannot be certain that the therapeutic techniques utilized were the primary causal agents in the observed changes. Moreover, the therapy processes were not mutually exclusive. Therapeutic techniques may have overlapped, or may have cancelled each other out. Mere clinical attention or the passage of time may have caused some of the changes observed in this study. However, the fact that some therapeutic techniques were systematically related to changes that were not vulnerable to reporting biases lends support to the idea that the therapists' actions contributed to these changes. Although one must remember that the therapist technique measure was susceptible to reporting biases. Furthermore, because the symptoms assessed in this study would be expected to be chronic and relatively stable in such a highly traumatized population, it is unlikely that the few pre-to-post therapy changes simply represented regressions to the mean spontaneous improvement. Though there is no control group, the sample of participants in this study had ongoing symptoms which were unlikely to remit without intervention. Similarly, the laboratory measures employed in this study have been found to have high temporal stability. Thus, pre-to-post therapy changes were probably not due to practice effects.

Therapist reports of their techniques have been shown to correlated highly with outside observers' assessments (Hilsenroth, Blagys, Ackerman, Bonge, & Blais, 2005). Given that the study utilized therapists' reports of their therapy processes, it is useful to look at the potential validity of this approach. One might be concerned that therapists were painting themselves in a positive light, or report use of techniques associated with their theoretical allegiance. The techniques which might most be vulnerable to self-report biases, "therapist was attuned, empathic," and "therapist was non-judgmental" were both

part of the psychodynamic scale, but psychodynamic therapy was practiced less on the whole than CBT and SIT. Even if therapists' reports are biased, they are nonetheless associated with change in domains which cannot be falsified by clients. Nonetheless, the validity of some of the therapy process scales is unknown and warrants further study.

Finally, the small sample size and large number of statistical tests raise concerns about both type I and type II errors. The sample size led to effects which were possibly clinically-significant, though only marginally statistically significant. Small sample size leads to decreased power, while multiple comparisons increase the likelihood that significant results are spurious. While one cannot be assured that some results presented herein are not due to chance, the presentation of findings was limited to effects that were of moderate or larger size, as determined by Cohen's standards (Cohen, 1992). The small sample size in this study is perhaps the best argument for the future continuation of this project.

Future directions.

Consistent with the limitations of this study, a larger replication and continuation of this study has the potential to make a substantial contribution to the scientific literature. It may be worthwhile to augment the current sample size in order to address issues of statistical power. Furthermore, it may be beneficial to conduct a scaled-back follow-up (e.g., using only self-report) with the study's current participants. Current treatment literature has few follow-up studies beyond the one-year point (Bradley, Greene, Russ, Dutra, & Westen, 2005). Consistent with the standards of randomized clinical trial, data on waitlist comparison participants may also be collected. Finally, it may be worthwhile to conduct the study utilizing therapy tapes from participants'

sessions, which can then be coded by the experimenter for greater assurance of validity of process assessments.

Summary and Implications

In sum, this study examined how psychotherapy techniques were related to changes in attentional biases, implicit memory and physiological reactivity to trauma reminders in a sample of severely traumatized women. This study sought to achieve three goals: 1) to provide a laboratory-based view of functioning associated with traumatization, 2) to understand how self-reported post-therapy symptom changes were related to changes in laboratory measures of trauma-related processes and 3) to understand how therapeutic processes were related to changes in symptoms and domains of functioning that are associated with trauma symptoms. The sample had significant psychopathology which was apparent in their reactions to trauma-related stimuli in laboratory assessments. The overall gains experienced by the women in this study were modest but encouraging, indicating that while therapy was helpful to participants, more treatment is necessary to fully address the needs of such a deeply traumatized sample. Therapy that emphasized relaxation, acceptance, memory reconstruction, and meaning-making appeared to be more helpful than therapy that encouraged exposure to trauma reminders, helped evaluate cognitive distortions or provided clients with explicit advice.

Though some of these findings appear to be self-evident, they are significant for several important reasons. First, they provide important knowledge about the scope and depth of traumatization and its effects on information processing and physiology. The small degree of change that occurred in this study may aid in demonstrating the pace and capacity of change in severely traumatized women. Appropriately-set expectations may

guide choices made by clinicians, clients and insurance providers. For managed care systems in which verification of improvement is necessary, laboratory assessments may provide important corroboration of the success of their intervention. Doing so may be particularly important when an insurance company has a narrow view of appropriate therapeutic technique which the therapist may feel is contraindicated for an individual client. Laboratory-assessed indicators of change may also be useful in cases in which secondary gain (e.g., disability or child support) may influence self-report. Furthermore, understanding a client's individual profile (e.g., over- versus under-aroused) may guide treatment choices.

A final word.

All told, this study represents an attempt to be simultaneously more specific and more broad; more specific about assessment and change, but more broad about what types of intervention are considered worthwhile, and with whom we conduct our research. One would be remiss in such a project to fail to mention the political reality of trauma treatment research. The gap between academic suggestions and clinical wisdom is perhaps wider than ever (Zayfert et al., 2005). Stalwart, stubborn and heated debates take place amongst cognitive-behavioral and psychodynamic camps. So, too, do such debates take place about effectiveness versus efficacy designs (For several spirited tête à têtes, see Crits-Christoph, Wilson, & Hollon, 2005; Franklin et al., 2006; Goldfried & Eubanks-Carter, 2004; Haaga, 2004; Weisz, Weersing, & Henggeler, 2005; Westen,

Novotny, & Thompson-Brenner, 2005; Westen et al., 2006). The findings of this study do not bestow a verdict or blessing upon any technique.

Beyond debates about the merit of this study, the clients presented herein—many of whom acknowledged they would not have entered treatment otherwise—felt helped and were quantifiably helped by their therapists. The data in this study support the experiences they reported. The value of such an experience is approximated by this project. However, even in-depth quantification cannot quite capture the meaning of the changes participants expressed. No study, no matter how elegantly designed, can convey what it looks like when a broken woman learns to walk tall. The results of this project are a humble offering at the feet of those women, for whom survival could not be taken for granted. It is an honor to bear witness to their growth.

Tables

Table 1. Client Demographics and Trauma Exposure

Variable (N = 27)	Frequency or Mean	Range
Age	M = 38.08, SD = 13.41	18-64
Race		
Euro-American	74%	
Native American	15%	
African American	7%	
South Asian	4%	
Sexual Orientation		
LGBTQ	20%	
Education		
No high school	11%	
High school, but no college	15%	
College	15%	
Post-baccalaureate	26%	
Trauma Exposure		
Different Types of events	M = 11.2, SD = 5.6	5-25
Nonsexual physical assaults	27%	
Sexual assaults	67%	
Both physical and sexual assaults	50%	
Age at first traumatic incident	M = 6.8, SD = 5.8	2-16
Age at most recent traumatic incident	M = 33.7, SD = 14.6	
Experienced trauma prior to age 14	85%	
Experienced trauma prior to age 7	63%	
Total number of events experienced, Including emotional abuse	M = 353.1, SD = 625.2	16-2544
Total number of events experienced, Excluding emotional abuse	M = 212.2, SD = 375.5	16-1654

Table 2. Manipulation Checks

Pair	*t*	df	*p*	*d*
Stroop				
Neutral vs. Trauma	3.67	26	.001***	0.91
Neutral vs. Depression	0.67	26	.51	0.16
Neutral vs. Anxiety	3.01	26	.006**	0.63
Neutral vs. Positive	0.23	26	.82	0.05
Depression vs. Trauma	7.02	26	.001***	1.04
Anxiety vs. Trauma	2.58	26	.02*	0.59
Positive vs. Trauma	7.97	26	.001***	1.18
Anxiety vs. Depression	-5.85	26	.001***	-0.81
Anxiety vs. Positive	-5.96	26	.001***	0.80
Word-Stem				
Trauma vs. Trauma Match	7.59	26	.001***	2.56
Anxiety vs. Anxiety Match	3.07	26	.005**	0.94
Positive vs. Positive Match	-1.93	26	.06+	-0.43
Neutral vs. Neutral Match	-1.15	26	.26	-0.39
Trauma Match vs. Neutral Match	-2.19	26	.04*	-0.58
Anxiety Match vs. Neutral Match	1.47	26	.15	0.39
Positive Match vs. Neutral Match	-0.96	26	.35	-0.32
Slide Task				
Heart Rate: Baseline vs. Trauma Slide	0.53	24	.59	0.03
Heart Rate: Trauma Slide vs. Recovery	6.38	25	.001***	0.28
RSA: Baseline vs. Trauma Slide	-0.37	24	.71	-0.05
RSA: Trauma Slide vs. Recovery	4.60	25	.001***	0.43
SCL: Baseline vs. Trauma Slide	1.50	24	.15	0.19
SCL: Trauma Slide vs. Recovery	-2.78	25	.01**	-0.18

+p < .1, *p < .05, **p < .01, ***p < .001; N = 27

Effect Size Standards (Cohen's *d*): small = .20, medium = .50, large = .80

Table 3. Descriptive Statistics of Therapy Techniques Across All Treatments

Type of Therapy Technique (possible range)	Mean	SD	Min	Max
Trauma-Focused SIT (1-9)	4.78	1.58	1.00	7.14
Trauma-related work on shame/guilt and meaning (1-9)	5.98	0.96	3.83	7.50
Trauma-Focused PE (1-9)	4.77	1.15	2.00	6.50
General Psychodynamic Therapy (1-9)	6.24	0.59	5.13	7.25
General CBT (1-9)	6.10	1.13	3.60	8.20
Working Alliance (1-5)	3.99	0.61	2.58	4.83

N = 22

Table 4. Hypothesis 1. Correlations of Symptoms with Stroop and Word-Stem at Time 1

	Neutral Stroop	Positive Stroop	Depression Stroop	Anxiety Stroop	Trauma Stroop	Neutral Word-Stem	Positive Word-Stem	Anxiety Word-Stem	Trauma Word-Stem
PTSD Symptom Total	.31	.14	-.21	-.21	-.25	.22	-.24	-.17	.51*
Intrusion Symptoms	.16	-.23	-.38+	-.39+	-.39+	.26	-.22	-.26	.50*
Avoidance/numbing Symptoms	.28	.17	-.03	-.08	-.12	.13	-.19	-.05	.36+
Hyperarousal Symptoms	.19	-.10	-.18	-.04	-.15	.11	-.18	-.10	.36+
Dissociation Symptoms	-.06	.38+	.12	.10	-.04	-.07	.16	-.11	-.04
Depression Symptoms	.10	-.12	-.08	-.04	-.14	.03	-.13	.04	.27
General Anxiety Symptoms	.07	-.15	-.36+	-.31	-.46*	.07	-.36+	-.20	.51**
Interpersonal Sensitivity	.07	.17	-.13	.06	-.05	.26	-.24	-.12	.43*

+p < .1, *p < .05, **p < .01, ***p < .001; N = 27;
Effect Size Standards (in *r*): small= .10, medium = .24, large = .37
PTSD symptoms (total and intrusion, avoidance/numbing and hyperarousal) were measured by the PCL. Dissociation symptoms were measured by the DES. Depression, anxiety and interpersonal sensitivity symptoms were measured by the BSI.

Table 5. Hypothesis 1: Correlations of Symptoms with Slide Task Physiology at Time 1

	PTSD Symptom Total	Intrusion Symptoms	Avoidance/numbing Symptoms	Hyperarousal Symptoms	Dissociation	Depression	Anxiety	Interpersonal Sensitivity
Heart Rate								
Baseline	.25	.16	.27	-.13	-.21	.10	.16	.39+
Trauma	.31	.21	.33	-.07	-.14	.17	.23	.39+
Recovery	.34	.22	.34	.05	.19	.25	.20	.47**
RSA								
Baseline	-.42+	-.25	-.35+	-.20	-.13	-.19	-.38+	-.45*
Trauma	-.35+	-.19	-.35+	-.16	-.14	-.27	-.37+	-.38+
Recovery	-.39+	-.22	-.40+	-.20	-.14	-.29	-.39+	-.36+
Skin Conductance Level								
Baseline	-.17	-.15	-.12	-.07	-.09	.04	-.19	.24
Trauma	-.11	-.09	-.12	.05	-.09	-.08	-.11	-.02
Recovery	.05	-.07	-.08	.08	-.06	-.11	-.08	-.09

+p < .1, *p < .05, **p < .01, ***p < .001; N = 27; Effect Size Standards (in *r*): small= .10, medium = .24, large = .37
PTSD symptoms (total and intrusion, avoidance/numbing and hyperarousal) were measured by the PCL. Dissociation symptoms were measured by the DES. Depression, anxiety and interpersonal sensitivity symptoms were measured by the BSI.

Table 6. Hypothesis 2: Symptom Descriptives and Pre- and Post-Therapy Tests of Change

Symptom and Possible Range	Time 1				Time 2				Change		
	Mean	SD	Min	Max	Mean	SD	Min	Max	*t*	*p*	*d*
PTSD Symptom Total (0-68)	35.77	12.86	14.00	58.00	30.79	17.63	4.00	61.00	1.80	.09+	0.32
Intrusion Symptoms (0-20)	9.69	4.92	3.00	20.00	8.84	6.01	1.00	19.00	0.76	.54	0.15
Avoidance/Numbing Symptoms (0-28)	13.79	5.61	3.00	26.00	11.21	7.25	2.00	24.00	1.90	.07+	0.39
Hyperarousal Symptoms (0-20)	11.26	4.54	4.00	18.00	9.63	5.86	0.00	19.00	1.95	.07+	0.31
Dissociation Symptoms (0-100)	40.7	18.6	6.1	76.8	44.0	21.6	0.6	75.5	0.32	.75	-0.16
Interpersonal Sensitivity (1-5)	2.92	0.88	1.75	5.00	2.84	0.96	1.50	4.75	0.53	.61	0.08
Depression Symptoms (1-5)	2.73	0.95	1.00	4.67	2.53	0.95	1.00	4.00	0.49	.63	0.22
General Anxiety Symptoms (1-5)	2.73	1.05	1.00	4.80	2.63	1.05	1.00	4.83	0.22	.83	0.09
Somatization (1-5)	2.18	0.86	1.14	4.00	2.23	0.77	1.00	3.71	0.07	.94	-0.06
Phobic Avoidance (1-5)	2.06	0.92	1.00	4.00	1.98	0.79	1.00	3.40	0.46	.65	0.09
Obsessive-Compulsive (1-5)	2.81	0.77	1.17	4.50	2.78	0.98	1.17	4.83	0.26	.79	0.03
Paranoid (1-5)	2.34	0.75	1.40	4.80	2.41	0.96	1.00	4.40	0.26	.79	-0.08
Psychotic (1-5)	2.24	0.74	1.00	3.40	2.26	0.85	1.00	4.00	0.17	.86	-0.02
Hostile (1-5)	1.99	0.69	1.00	3.40	2.13	1.05	1.00	4.60	-0.94	.69	-0.16
Worst (1-5)	3.47	0.92	1.75	5.00	2.97	1.18	1.33	5.00	2.60	.02*	0.47
Global Symptom Severity (1-5)	2.43	0.62	1.19	3.71	2.42	0.84	1.26	4.09	0.06	.95	0.01

+p < .1, *p < .05, **p < .01, ***p < .001; Time 1: N = 27; Time 2: N = 26; Effect Size Standards (Cohen's *d*): small = .20, medium = .50, large = .80
PTSD symptoms (total and intrusion, avoidance/numbing and hyperarousal) were measured by the PCL. Dissociation symptoms were measured by the DES. Depression, anxiety and interpersonal sensitivity symptoms were measured by the BSI.

Table 7. Hypothesis 2: Stroop Descriptives and Pre-to-Post Therapy Changes (Colors Named for Each List)

	Time 1				Time 2				Change		
	Mean	SD	Min	Max	Mean	SD	Min	Max	*t*	*p*	*d*
Neutral	41.00	11.61	19.00	80.00	43.00	7.74	28.00	58.00	0.71	.49	-0.20
Positive	40.52	7.16	28.00	58.00	43.30	6.64	29.00	56.00	2.7	.01**	-0.40
Depression	39.46	7.15	26.00	55.00	43.48	6.58	34.00	62.00	3.1	.001***	-0.59
Anxiety	34.77	8.23	18.00	54.00	38.09	7.27	26.00	52.00	2.3	.03*	-0.43
Trauma	32.58	6.96	20.00	46.00	37.13	9.13	24.00	58.00	3.0	.01**	-0.56

+p < .1, *p < .05, **p < .01, ***p < .001; Time 1: N = 27; Time 2: N = 24; Effect Size Standards (Cohen's *d*): small = .20, medium = .50, large = .80

Table 8. Hypothesis 2:Word Stem Descriptives and Pre-to-Post Therapy Changes (Stems Completed with Primed Words)

	Time 1				Time 2				Change		
	Mean	SD	Min	Max	Mean	SD	Min	Max	*t*	*p*	*d*
Neutral Targets	1.04	1.13	0.00	4.00	0.83	0.92	0.00	3.00			
Neutral Match	1.44	1.15	0.00	4.00	1.75	1.11	0.00	4.00			
Neutral Target - Match	-.41	1.89	-4.00	4.00	-0.92	1.38	-4.00	1.00	1.50	.16	-0.31
Positive Target	0.67	0.92	0.00	3.00	0.58	0.97	0.00	4.00			
Positive Match	1.44	0.80	0.00	3.00	1.71	0.69	0.00	3.00			
Positive Target – Match	-0.78	1.42	-3.00	3.00	-1.13	1.30	-3.00	4.00	-2.12	.04*	-0.26
Anxiety Target	3.04	0.98	1.00	5.00	3.21	1.32	1.00	5.00			
Anxiety Match	2.11	1.15	.00	4.00	2.50	0.93	1.00	5.00			
Anxiety Target – Match	0.93	1.52	-2.00	4.00	.71	1.90	-4.00	4.00	-0.32	.75	0.13
Trauma Target	5.37	2.12	2.00	10.00	4.50	2.34	1.00	9.00			
Trauma Match	1.52	0.94	0.00	3.00	2.21	1.28	0.00	5.00			
Trauma Target – Match	3.85	2.60	0.00	10.00	2.29	3.33	-3.00	9.00	3.57	.002**	0.52

*p < .05, **p < .01, ***p < .001; Time 1: N = 27; Time 2: N = 24; Effect Size Standards (Cohen's *d*): small = .20, medium = .50, large = .80

Table 9. Hypothesis 2: Slide Task Descriptives and Pre-to-Post Therapy Changes (Emotional Responses and Physiological Activity)

	Time 1				Time 2				Change		
	Mean	SD	Min	Max	Mean	SD	Min	Max	*t*	*p*	*d*
Self-Report Emotion											
Distress	2.59	1.01	0	4	2.39	1.03	1	4	1.24	.23	0.19
Sadness	2.56	0.93	1	4	2.43	0.95	1	4	1.16	.26	0.14
Anxiety	2.67	1.00	1	4	2.17	1.27	0	4	1.84	.08+	0.44
Disgust	2.74	1.13	0	4	2.48	1.50	0	4	1.45	.16	0.19
Calm	0.70	0.99	0	3	0.74	0.86	0	3	-0.19	.85	-0.04
Safety	1.04	1.13	0	3	1.65	1.49	0	4	-1.75	.09+	-0.46
Heart Rate											
Baseline	64.37	14.17	44.43	93.14	62.17	17.58	43.69	89.73	0.52	.61	0.14
Positive	65.85	12.69	43.19	94.89	66.18	16.81	42.98	87.44	1.03	.31	-0.02
Trauma	64.89	13.08	43.53	90.56	61.66	15.77	43.01	89.42	.85	.40	0.22
Recovery	61.27	13.33	43.02	86.22	58.19	17.56	44.04	88.04	.82	.42	0.19
RSA											
Baseline	0.031	0.039	.00	0.12	0.034	0.050	0.01	2.72	-.034	.74	-0.06
Positive	0.025	0.024	.00	0.09	0.19	0.59	0.01	2.97	-0.65	.36	-0.39
Trauma	0.031	0.042	.00	0.20	0.031	0.027	0.01	3.29	0.07	.95	-0.08
Recovery	0.015	0.027	.00	0.13	0.009	0.009	0.01	3.67	1.28	.21	0.29
Skin Conductance Level											
Baseline	4.24	1.95	1.53	9.94	4.55	2.47	1.52	8.97	-0.53	.59	-0.14
Positive	4.08	2.12	1.55	8.76	4.00	2.11	1.54	8.65	-0.32	.75	0.04
Trauma	3.93	1.54	1.60	8.24	3.89	1.85	1.59	8.20	0.07	.94	0.02
Recovery	4.18	1.65	1.61	9.99	4.62	2.32	1.60	8.48	-0.91	.37	-0.22

Heart Rate: Beats Per Minute; RSA: Seconds; SCL: microSiemens

+p < .1, *p < .05, **p < .01, ***p < .001; Time 1: N = 27; Time 2: N = 23; Effect Size Standards (Cohen's *d*): small = .20, medium = .50, large = .80

Table 10. Post-therapy biases in Stroop, Word Stem and Slide Task.

	t	*p*	*d*
Stroop			
Neutral vs. Trauma	3.65	.001***	.69
Neutral vs. Depression	-0.32	.75	-0.06
Neutral vs. Anxiety	6.06	.001***	0.65
Neutral vs. Positive	-0.38	.71	-0.04
Word Stem			
Trauma vs. Target Match	2.63	.02*	1.21
Anxiety vs. Anxiety Match	1.83	.08+	0.62
Positive vs. Positive Match	-4.16	.001***	-1.34
Neutral vs. Neutral Match	-3.22	.01**	-0.88
Trauma Match vs. Neutral Match	1.35	.19	0.38
Heart Rate			
Baseline vs. Trauma Slide	0.53	.59	0.02
Trauma Slide vs. Recovery	6.38	.001***	0.00
RSA			
Baseline vs. Trauma Slide	-0.37	.71	-0.03
Trauma Slide vs. Recovery	4.60	.001***	0.04
Skin Conductance Level			
Baseline vs. Trauma Slide	3.48	.002**	0.21
Trauma Slide vs. Recovery	-2.22	.04*	-0.17

+p < .1, *p < .05, **p < .01, ***p < .001; N = 24

Effect Size Standards (Cohen's *d*): small = .20, medium = .50, large = .80

Table 11. Correlations of Other Variables Potentially Related to Change

	Age	Education Level	Pre-Therapy Dissociation	Age of First Trauma	Different Trauma Types	Total Number of Traumas
PTSD Symptom Total Change	-.03	.13	.09	-.15	.19	.44*
Intrusion Symptom Change	-.20	-.01	-.30	.27	-.14	-.43+
Avoidance/Numbing Symptom Change	.11	.16	-.38+	.13	-.07	-.47*
Hyperarousal Symptom Change	.06	-.01	-.44+	.22	-.19	-.50*
Dissociation Change	.22	.07	--	-.15	.19	.01
Worst Distress Change						
Depression Change	.18	.03	-.39+	.07	-.01	-.35+
Anxiety Change	.27	.07	-.24	.11	.22	-.09
Interpersonal Sensitivity Change	-.05	-.03	-.19	-.03	.04	-.29
Neutral Stroop Change	-.24	-.41*	-.12	-.003	-.04	.15
Positive Stroop Change	.19	.02	-.19	.08	-.01	.36
Depression Stroop Change	.02	-.13	-.21	.10	.09	.26
Anxiety Stroop Change	.09	.001	-.40*	-.02	-.07	.08
Trauma Stroop Change	.12	.55*	-.19	.02	.06	.24
Neutral Word Stem Change	-.36	-.21	.06	.04	-.03	-.10
Positive Word Stem Change	-.07	-.04	.02	-.17	.23	.04
Anxiety Word Stem Change	-.14	-.35	.07	.03	-.02	-.06
Trauma Word Stem Change	-.11	.06	-.09	.53*	-.24	-.13

(Table 11 cont)	Age	Education Level	Pre-Therapy Dissociation	Age of First Trauma	Different Trauma Types	Total Number of Traumas
Baseline Slide HR Change	-.19	-.11	-.17	.32	-.30	-.02
Trauma Slide HR Change	-.13	-.10	-.06	.23	-.14	.08
Recovery Slide HR Change	-.07	-.05	.-05	.13	-.14	.1
Baseline Slide RSA Change	.29	.35	-.01	-.07	.29	.11
Trauma Slide RSA Change	-.01	-.24	-.10	.09	-.23	-.36
Recovery Slide RSA Change	-.06	-.32	-.17	-.23	-.24	-.13
Baseline Slide SCL Change	.26	-.03	-.17	.14	.13	-.07
Trauma Slide SCL Change	.23	-.03	-.15	.01	.08	-.08
Recovery Slide SCL Change	.45**	.04	.01	-.09	.29	.06

+p < .1, *p < .05, **p < .01, ***p < .001; N = 24; Effect Size Standards (in *r*): small= .10, medium = .24, large = .37. PTSD symptoms were measured by the PCL. Dissociation symptoms were measured by the DES. Depression, anxiety and interpersonal sensitivity symptoms were measured by the BSI.

Table 12. Hypothesis 3: Correlation of Symptom Changes with Stroop and Word Stem Changes

	PTSD Total	Intrusion	Avoidance/ Numbing	Hyper-arousal	Dissociation	Worst Distress	Depression	Anxiety	Interpersonal Sensitivity
Neutral Stroop Change	-.08	-.25	-.36	-.30	.09	-.13	-.09	-.18	.23
Positive Stroop Change	.49+	.52+	.14	.51+	.43+	.15	.27	.17	.15
Depression Stroop Change	.51 +	.70**	.13	.42+	-.09	.32	.31	.33	.39+
Anxiety Stroop Change	.65**	.73 **	.49+	.81**	.11	.44	.41+	.41+	.42+
Trauma Stroop Change	.44+	.55*	-.21	.23	.63**	-.06	.25	.37	.21
Neutral Word Stem Change	-.09	.11	.14	.17	-.29	-.02	-.24	-.02	.02
Positive Word Stem change	.07	-.19	.46+	-.08	-.38+	-.13	-.01	-.21	-.25
Anxiety Word Stem Change	-.25	.14	-.43+	-.29	.12	-.02	-.08	.02	.003
Trauma Word Stem Change	-.16	-.17	-.37+	-.54*	-.04	.06	-.04	.20	.07

+p < .1, *p < .05, **p < .01; Stroop N = 23; Word Stem N = 24; Effect Size Standards (in *r*): small= .10, medium = .24, large = .37

PTSD symptoms (total and intrusion, avoidance/numbing and hyperarousal) were measured by the PCL. Dissociation symptoms were measured by the DES. Depression, anxiety and interpersonal sensitivity symptoms were measured by the BSI.

Table 13. Hypothesis 3: Correlation of Symptom Changes with Slide Task Physiology Changes

	PTSD Total	Intrusion	Avoidance/ Numbing	Hyperarousal	Dissociation	Worst Symptoms	Depression	Anxiety	Interpersonal Sensitivity
Slide Heart Rate									
Baseline	.31	.30	.09	.27	.14	-.03	-.28	-.07	-.26
Trauma	.26	.37+	.07	.30	.06	.194	-.20	.27	-.29
Recovery	.38+	.32	.15	.25	.21	.41+	.17	.43+	-.38+
Slide RSA									
Baseline	-.43+	-.42+	-.21	-.29	-.24	-.39+	.23	-.43+	-.56*
Trauma	.46+	.44+	.22	.22	.22	-.39+	.12	-.45+	-.56*
Recovery	-.45+	-.44+	-.23	-.29	-.26	-.39+	-.19	-.45+	-.57*
Slide Skin Conductance Level									
Baseline	.06	.14	.16	.18	.08	.30	.09	-.01	.23
Trauma	-.20	.06	-.12	-.10	-.12	.32	.09	.12	.09
Recovery	.33	.17	.42+	.26	.38+	.37	.16	.43+	.16

+p < .1, *p < .05, **p < .01, ***p < .001; N = 24; Effect Size Standards (in *r*): small= .10, medium = .24, large = .37

PTSD symptoms (total and intrusion, avoidance/numbing and hyperarousal) were measured by the PCL. Dissociation symptoms were measured by the DES. Depression, anxiety and interpersonal sensitivity symptoms were measured by the BSI.

Table 14. Hypothesis 4: Therapy Process Predicting Change

	Trauma-Related Work on Shame/Guilt and Meaning	Trauma-Focused PE	Trauma-Focused SIT	Psychodynamic Therapy	General CBT	Working Alliance
Symptoms						
PTSD Total	-.53*	.12	-.52*	-.48+	-.36	.05
Intrusion	-.54*	.06	-.52*	-.47+	-.32	.33
Avoidance	-.47+	.11	-.36	-.59*	-.48+	.10
Hyperarousal	-.43+	.17	-.43+	-.40+	-.35	-.08
Dissociation	.07	-.04	.09	.26	.64**	-.11
Interpersonal	-.37+	.18	-.18	-.38+	.001	.08
Sensitivity						
Depression	-.37+	.01	-.37+	-.24	-.18	.07
Anxiety	-.51+	.17	-.06	-.14	.03	-.19
Stroop						
Neutral	-.19	.16	.16	.24	.26	-.23
Positive	-.28	-.01	.09	-.33	-.17	-.14
Depression	-.05	-.19	.27	-.14	-.01	-.01
Anxiety	.39+	-.37+	.29	-.07	-.03	.01
Trauma	-.08	-.15	.12	-.01	-29	.22
Word Stem						
Neutral	-.18	.07	-.24	-.16	-.11	-.23
Positive	-.03	.06	-.04	.06	.21	-.14
Anxiety	-.01	-.09	-.38+	-.58**	-.15	.01
Trauma	.28	-.17	.25	-.12	-.46*	.22
Heart Rate						
Baseline	-.13	-.12	.24	.09	.28	.12
Trauma Slide	-.14	-. 6	.23	.12	.36	.16
Recovery	-.23	-.07	.05	.18	.47*	.06

(Table 14 cont.)	Trauma-Related Work on Shame/Guilt and Meaning	Trauma-Focused PE	Trauma-Focused SIT	Psychodynamic Therapy	General CBT	Working Alliance
RSA						
Baseline	.23	-.13	.10	.40+	.29	.13
Trauma Slide	.46*	-.37+	.41*	.31	.37+	.24
Recovery	.46*	-.25	.36	.34	.28	.22
Skin Conductance						
Baseline	-.41+	.22	.04	.24	.33	-.28
Trauma Slide	-.35	.10	.04	.20	.29	.17
Recovery	-.32	.08	.24	.33	.33	-.47*

+p < .1, *p < .05, **p < .01, ***p < .001; Effect Size Standards (in *r*): small= .10, medium = .24, large = .37; N = 20

PTSD symptoms (total and intrusion, avoidance/numbing and hyperarousal) were measured by the PCL. Dissociation symptoms were measured by the DES. Depression, anxiety and interpersonal sensitivity symptoms were measured by the BSI.

Table 15. Summary of Hypothesis-Driven Testing

Hypothesis 1.		**Outcome**		
	Primary			
Stroop	PTSD intrusion correlated with	Trauma Stroop *Yes*	Anxiety Stroop *No*	
	PTSD hyperarousal correlated with	Trauma Stroop *No*	Anxiety Stroop *No*	
	PTSD avoidance/numbing correlated with	Trauma Stroop *No*	Anxiety Stroop *Yes*	
Word Stem	Intrusion related to more	Trauma Word Stem *Yes*	Anxiety Word Stem *No*	
	Avoidance/numbing related to more implicit memory for trauma and anxiety words	Trauma Word Stem *Yes*	Anxiety Word Stem *No*	
Slide	More severe PTSD Symptoms related to	Higher HR *No*	Higher SC *Yes*	Lower RSA *No*
	Secondary			
Stroop	More anxiety related to	Anxiety Stroop *No*	Trauma Stroop *Yes*	
	More depression related to	Depression Stroop *No*		
	More dissociation related to	Trauma Stroop *No*	Anxiety Stroop *No*	

Word Stem	More anxiety related to	Anxiety Word Stem *No*	Trauma Word Stem *Yes*		
Slide Task	Anxiety related to	Higher HR *No*	Higher SC *No*	Lower RSA *Yes*	
	Dissociation related to	Lower HR *No*	Lower SC *No*	Lower RSA *No*	
	Interpersonal sensitivity related to	Lower RSA *Yes*			
Hypothesis 2.	*Primary*				
Symptoms	Improvements in symptoms will occur in	PTSD *Yes*	Interpersonal Sensitivity *No*	Depression *No*	Anxiety *No*
Stroop	Improvements in	Anxiety Stroop *Yes*	Trauma Stroop *Yes*		
	No change in	Neutral Stroop *Yes*			
Word Stem	Improvement in	Trauma Word Stem *Yes*	Anxiety Word Stem *No*		
Slide Task	Decreases in	HR *No*	SCL *No*		
	Increases in	RSA *No*			

	Secondary		
Symptoms	Marginal Improvement in	Dissociation *No*	
Word Stem	Improvement in	Positive Word Stem *No*	
Hypothesis 3	Change in symptoms and lab tasks will	Covary *Yes*	
Hypothesis 4.	*Primary*		
	More PE process will be related to improvement in	PTSD symptoms *No*	
	More SIT process will be related to improvement in	PTSD symptoms *Yes*	
	More SGM process will be related to improvement in	PTSD symptoms *No*	
Stroop	More SIT process will be related to improvement in	Trauma Stroop *No*	Anxiety Stroop *No*
	More PE process will be related to improvement in	Trauma Stroop *No*	Anxiety Stroop *No (worse)*
	More SGM process will be related to no changes in	Trauma Stroop *No*	Anxiety Stroop *No (improved)*

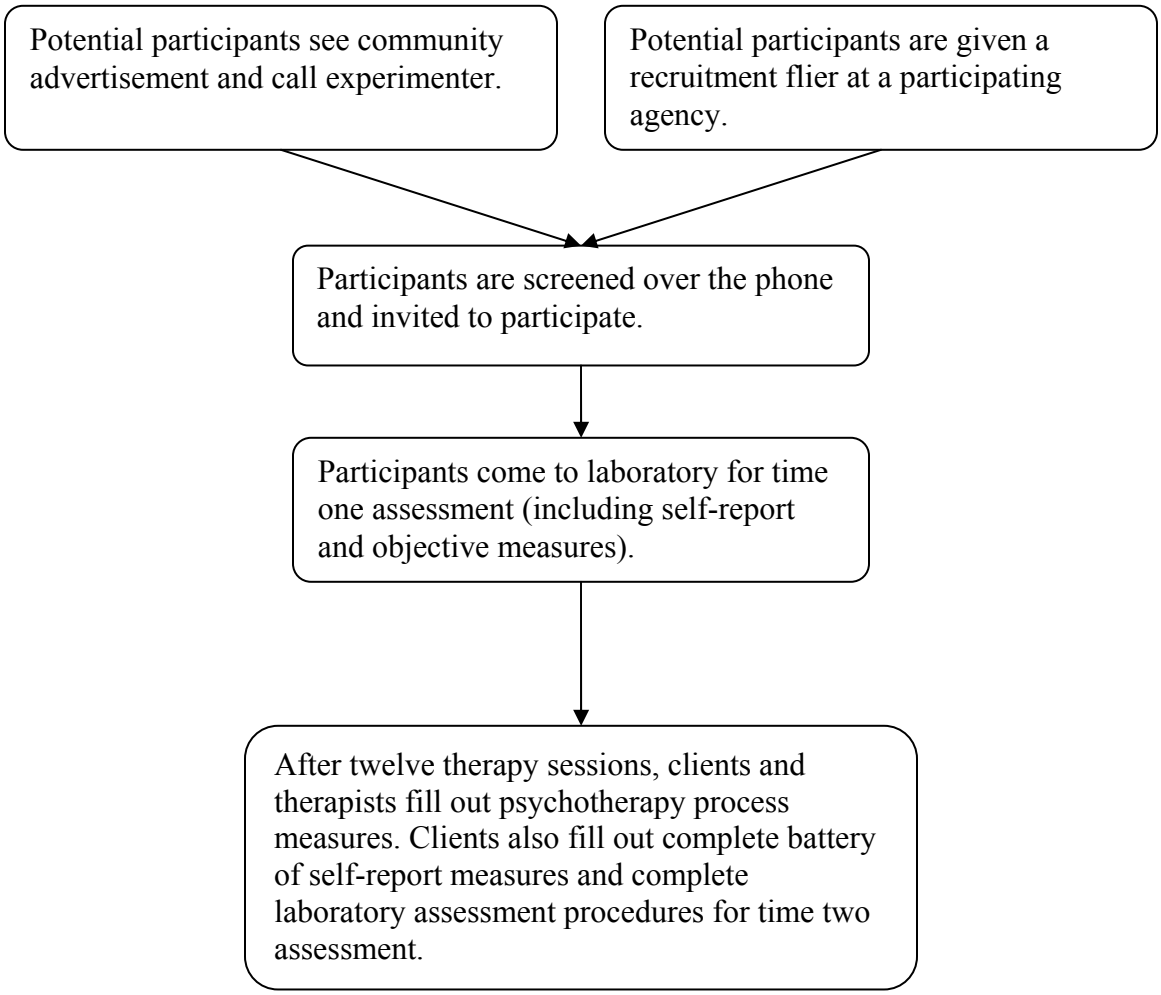
Word Stem	More SGM process will be related to improved	Trauma Word Stem *No*	Anxiety Word Stem *No*		
	More SIT process will be related to improved	Trauma Word Stem *No*	Anxiety Word Stem *No*		
	More PE process will be related to improved	Trauma Word Stem *No*	Anxiety Word Stem *No*		
Slide Task	More SGM process will be related to	Lower HR *No*	Higher RSA *Yes*	Lower SCL *Yes*	
	More PE process will be related to	Lower HR *No*	Higher RSA *No (lower)*	Lower SCL *No*	
	More SIT process will be related to	Lower HR *No*	Higher RSA *Yes*	Lower SCL *No*	
	Secondary				
Symptoms	More General PD process will be related to improvements in	PTSD *Yes*	Interpersonal sensitivity *Yes*	Depression *No*	Anxiety *No*
	More General CBT process will be related to improvements in	PTSD *Yes*	Interpersonal sensitivity *No*	Depression *No*	Anxiety *No*

Stroop	More General PD process will be related to improvements in	Trauma Stroop *No*	Anxiety Stroop *No*
	More General CBT process will be related to improvements in	Trauma Stroop *No*	Anxiety Stroop *No*
Word Stem	More General PD process will be related to improvements in	Trauma Word Stem *No*	Anxiety Word Stem *No*
	More General CBT process will be related to improvements in	Trauma Word Stem *No*	Anxiety Word Stem *Yes*
Slide Task	More General PD process will be related to	Higher RSA *Yes*	Lower SCL *No*
	More General PD process will be related to	Lower HR *No (higher)*	Lower SCL *No*

Note: PTSD = Posttraumatic Stress Disorder; HR = Heart Rate; RSA = Respiratory Sinus Arrthymia; SCL = Skin conductance Level; SGM = Shame, Guilt and Meaning Therapy; PE = Prolonged Exposure; SIT = Stress Inoculation Training; PD = Psychodynamic; CBT = Cognitive Behavioral Therapy

Appendices

Appendix 1. Procedure



Appendix 2: Constructs and Operationalized Variables

Construct	Operationalized Variable	Assessment Method	Time 1	Time 2
Subjective Changes				
PTSD Symptoms	Posttraumatic Stress Disorder Checklist (PCL) Subscales: Intrusion, avoidance/numbing and Hyperarousal	Client Self-Report	Y	Y
Other Psychiatric Distress	Brief Symptom Inventory (BSI) Subscales: GSI (Global Severity), Depression, Anxiety, Interpersonal Sensitivity, and "Worst" out of all 9 subscales	Client Self-Report	Y	Y
Dissociation	Dissociative Experiences Scale (DES)	Client Self-Report	Y	Y
Objective Changes				
Attentional biases for trauma stimuli	Stroop task: Number of words read. Five Categories: Neutral, Positive, Depression, Anxiety, Trauma	Laboratory	Y	Y
Implicit memory for trauma stimuli	Word-stem Completion Task: Number of words of each type used to fill in stems. Four Categories: Neutral, Positive, Anxiety, Trauma	Laboratory	Y	Y
Physiological Activity	Physiological activity (heart rate, skin conductance, RSA) during the Slide Task	Laboratory	Y	Y
Assessment of Therapy Process				
Working alliance	Client report on Working Alliance Inventory (WAI)	Client Self-Report	N	Y
General Psychotherapy Process	Therapist Report on Psychotherapy Process Q-Set (PQS)	Therapist Self-Report	N	Y
Trauma-Focused Psychotherapy Process	Trauma-Focused Psychotherapy Process Inventory (TFPPI)	Therapist Self-Report	N	Y

Construct	Operationalized Variable			
Potential Control Variables				
Client Demographics	Client Demographic Questionnaire (age, race, SES, etc.)	Client Self-Report	Y	N
Therapist Demographics	Therapist Demographic Questionnaire (age, training, years of experience)	Therapist Self-Report	N	Y
Client Trauma History	Trauma History Questionnaire (type of events, age when first occurred, number of types events occurred)	Client Self-Report	Y	N

Appendix 3. PTSD Symptom Checklist

INSTRUCTIONS: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month. For each item, you are asked to rate the *Intensity* (i.e., how strong, bad or intense the problem is) and the *Frequency* (i.e., how often the problem occurs).

1.	Repeated, disturbing *memories, thoughts,* or *images* of a stressful experience from the past?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
2.	Repeated, disturbing *dreams* of a stressful experience from the past?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
3.	Suddenly *acting* or *feeling* as if a stressful experience *were happening again* (as if you were reliving it)?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
4.	Feeling *very upset* when *something reminded you* of a stressful experience from the past?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**

5. Having *physical reactions* (e.g., heart pounding, trouble breathing, sweating) when *something reminded you* of a stressful experience from the past?	**Intensity:**				
	Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
	Frequency:				
	Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
6. Avoiding *thinking about* or *talking about* a stressful experience from the past or avoiding *having feelings* related to it?	**Intensity:**				
	Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
	Frequency:				
	Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
7. Avoiding *activities* or *situations* because *they reminded you* of a stressful experience from the past?	**Intensity:**				
	Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
	Frequency:				
	Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
8. Trouble *remembering important parts* of a stressful experience from the past?	**Intensity:**				
	Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
	Frequency:				
	Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
9. *Loss of interest* in activities that you used to enjoy?	**Intensity:**				
	Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
	Frequency:				
	Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**

10.	Feeling *distant* or *cut off* from other people?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
12.	Feeling as if your *future* will somehow be *cut short*?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
13.	Trouble *falling* or *staying asleep*?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**
14.	Feeling *irritable* or having *angry outbursts*?	**Intensity:**				
		Not at all (0)	**A little bit (1)**	**Moderately (2)**	**Quite a bit (3)**	**Extremely (4)**
		Frequency:				
		Never (0)	**1-2 times month (1)**	**1-2 times/ week (2)**	**3-4 times/ week (3)**	**Daily (4)**

15.	Having *difficulty concentrating*?	**Intensity:**				
		Not at all	**A little bit**	**Moderately**	**Quite a bit**	**Extremely**
		(0)	**(1)**	**(2)**	**(3)**	**(4)**
		Frequency:				
		Never	**1-2 times month**	**1-2 times/ week**	**3-4 times/ week**	**Daily**
		(0)	**(1)**	**(2)**	**(3)**	**(4)**
16.	Being *"super-alert"* or watchful or on guard?	**Intensity:**				
		Not at all	**A little bit**	**Moderately**	**Quite a bit**	**Extremely**
		(0)	**(1)**	**(2)**	**(3)**	**(4)**
		Frequency:				
		Never	**1-2 times month**	**1-2 times/ week**	**3-4 times/ week**	**Daily**
		(0)	**(1)**	**(2)**	**(3)**	**(4)**
17.	Feeling *jumpy* or easily startled?	**Intensity:**				
		Not at all	**A little bit**	**Moderately**	**Quite a bit**	**Extremely**
		(0)	**(1)**	**(2)**	**(3)**	**(4)**
		Frequency:				
		Never	**1-2 times month**	**1-2 times/ week**	**3-4 times/ week**	**Daily**
		(0)	**(1)**	**(2)**	**(3)**	**(4)**

Appendix 4: Dissociative Experiences Scale

Instructions: This questionnaire is about experiences that you may have in your daily life. We are interested in how often you think you have these experiences compared to other people your age. You may not be precisely sure about how you compare. We just want you to take your best guess. It is important, however, that your answers reflect how you are when you are not under the influence of alcohol or drugs. Place an "X" to show how much of the time this happens to you compared to the average person you know.

	Much less than others				**About the same as others**						**Much more than others**
1. Some people have the experience during driving or riding in a car or bus or subway and suddenly realize that they don't remember what has happened during part or all of the trip	0	1	2	3	4	5	6	7	8	9	10
2. Some people find that sometimes they are listening to someone talk and they suddenly realize they did not hear part or all of what was said	0	1	2	3	4	5	6	7	8	9	10
3. Some people have the experience of finding themselves in a place and having no idea how they got there	0	1	2	3	4	5	6	7	8	9	10
4. Some people have the experience of finding themselves dressed in clothes that they don't remember putting on	0	1	2	3	4	5	6	7	8	9	10
5. Some people have the experience of finding new things among their belongings that they do not remember buying	0	1	2	3	4	5	6	7	8	9	10
6. Some people sometimes find that they are approached by people who call them by another name or insist that they have met before	0	1	2	3	4	5	6	7	8	9	10
7. Some people sometimes have the experience of feeling as if they are standing next to themselves or watching themselves do something and they actually see themselves do something and they actually see themselves as if they were looking at another person	0	1	2	3	4	5	6	7	8	9	10
8. Some people are told that they sometimes do not recognize friends or family members	0	1	2	3	4	5	6	7	8	9	10
9. Some people find that they have no memory for some important events in their lives (a wedding or graduation, for example)	0	1	2	3	4	5	6	7	8	9	10

	Much less than others					**About the same as others**					**Much more than others**
10. Some people have the experience of being accused of lying when they do not think that they have lied	0	1	2	3	4	5	6	7	8	9	10
11. Some people have experience of looking in a mirror and not recognizing themselves	0	1	2	3	4	5	6	7	8	9	10
12. Some people have the experience of feeling that other people, objects and the world around them are not real	0	1	2	3	4	5	6	7	8	9	10
13. Some people have the experience that their body does not seem to belong to them	0	1	2	3	4	5	6	7	8	9	10
14. Some people have the experience of sometimes remembering a past event so vividly that they feel as they were reliving that event	0	1	2	3	4	5	6	7	8	9	10 if
15. Some people have the experience of not being sure whether things that they remember happening really did happen or whether they just dreamed them	0	1	2	3	4	5	6	7	8	9	10
16. Some people have the experience of being in a familiar place but finding it strange and unfamiliar	0	1	2	3	4	5	6	7	8	9	10
17. Some people find that when they are watching television of a movie they become so absorbed in the story that they are unaware of other events happening around them	0	1	2	3	4	5	6	7	8	9	10
18. Some people find that they become so involved in a fantasy or daydream that it feels as though it were really happening to them	0	1	2	3	4	5	6	7	8	9	10
19. Some people find that they are able to ignore pain	0	1	2	3	4	5	6	7	8	9	10
20. Some people find that they sometimes sit staring off into space, thinking of nothing, and are not aware of the passage of time	0	1	2	3	4	5	6	7	8	9	10
21. Some people sometimes find that when they are alone they talk out loud to themselves	0	1	2	3	4	5	6	7	8	9	10
22. Some people find that in one situation they may act so differently compared with another situation that they feel almost as if they were two different people	0	1	2	3	4	5	6	7	8	9	10

	Much less than others				**About the same as others**						**Much more than others**
23. Some people sometimes find that in certain situations they are able to do things with amazing ease and spontaneity that would usually be difficult of them	0	1	2	3	4	5	6	7	8	9	10
24. Some people sometimes find that they cannot remember whether they have done something or have just thought about doing that thing (for example, not knowing whether they have mailed a letter or just thought about it)	0	1	2	3	4	5	6	7	8	9	10
25. Some people sometimes find evidence that they have done things that they do not remember doing	0	1	2	3	4	5	6	7	8	9	10
26. Some people sometimes find writings, drawings, or notes among their belongings that they must have done but cannot remember doing	0	1	2	3	4	5	6	7	8	9	10
27. Some people sometimes find that they hear voices inside their head that tell them to do things or comment on the things that they are doing	0	1	2	3	4	5	6	7	8	9	10
28. Some people sometimes feel as if they are looking at the world through a fog so that people and objects appear far away or unclear	0	1	2	3	4	5	6	7	8	9	10
29. Some people sometimes feel like they are dreaming when they are actually awake	0	1	2	3	4	5	6	7	8	9	10
30. Some people sometimes feel like they are disconnected from their body	0	1	2	3	4	5	6	7	8	9	10
31. Some people sometimes feel like they cannot move their hands or feet	0	1	2	3	4	5	6	7	8	9	10

Appendix 5. Brief Symptom Inventory

In the past month, how much were you distressed by:

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1..	Nervousness or shakiness inside	1	2	3	4	5
2.	Faintness or dizziness	1	2	3	4	5
3.	The idea that someone else can control your thoughts	1	2	3	4	5
4.	Feeling others are to blame for most of your troubles	1	2	3	4	5
5.	Trouble remembering things	1	2	3	4	5
6.	Feeling easily annoyed or irritated	1	2	3	4	5
7.	Pains in heart or chest	1	2	3	4	5
8.	Feeling afraid in open spaces or on the streets	1	2	3	4	5
9.	Thoughts of ending your life	1	2	3	4	5
10.	Feeling that most people cannot be trusted	1	2	3	4	5
11.	Poor appetite	1	2	3	4	5
12.	Suddenly scared for no reason	1	2	3	4	5
13.	Temper outbursts that you could not control	1	2	3	4	5
14.	Feeling lonely even when you are with people	1	2	3	4	5
15.	Feeling blocked in getting things done	1	2	3	4	5
16.	Feeling lonely	1	2	3	4	5
17.	Feeling blue	1	2	3	4	5
18.	Feeling no interest in things	1	2	3	4	5
19.	Feeling fearful	1	2	3	4	5
20.	Your feelings being easily hurt	1	2	3	4	5
21.	Feeling that people are unfriendly or dislike you	1	2	3	4	5
22.	Feeling inferior to others	1	2	3	4	5
23.	Nausea or upset stomach	1	2	3	4	5
24.	Feeling that you are watched or talked about by others	1	2	3	4	5
25.	Trouble falling asleep	1	2	3	4	5
26.	Having to check and double-check what you do	1	2	3	4	5
27.	Difficulty making decisions	1	2	3	4	5
28.	Feeling afraid to travel on buses, subways or trains	1	2	3	4	5
29.	Trouble getting your breath	1	2	3	4	5
30.	Hot or cold spells	1	2	3	4	5
31.	Having to avoid certain things, places or activities because they frighten you	1	2	3	4	5
32.	Your mind going blank	1	2	3	4	5
33.	Numbness or tingling in parts of your body	1	2	3	4	5
34.	The idea that you should be punished for your sins	1	2	3	4	5
35.	Feeling hopeless about your future	1	2	3	4	5
36.	Trouble concentrating	1	2	3	4	5
37.	Feeling weak in parts of your body	1	2	3	4	5

		Not at all	A little bit	Moderately	Quite a bit	Extremely
38.	Feeling tense or keyed up	1	2	3	4	5
39.	Thoughts of death or dying	1	2	3	4	5
40.	Having urges to beat, injure or harm someone	1	2	3	4	5
41.	Having urges to break or smash things	1	2	3	4	5
42.	Feeling very self-conscious with others	1	2	3	4	5
43.	Feeling uneasy in crowds, such as shopping or at a movie	1	2	3	4	5
44.	Never feeling close to another person	1	2	3	4	5
45.	Spells of terror or panic	1	2	3	4	5
46.	Getting into frequent arguments	1	2	3	4	5
47.	Feeling nervous when you are left alone	1	2	3	4	5
48.	Others not giving you proper credit for your achievements	1	2	3	4	5
49.	Feeling so restless you couldn't sit still	1	2	3	4	5
50.	Feelings of worthlessness	1	2	3	4	5
51.	Feeling that people will take advantage of you if you let them	1	2	3	4	5
52.	Feelings of guilt	1	2	3	4	5
53.	The idea that something is wrong with your mind	1	2	3	4	5

Appendix 6. Trauma History Questionnaire

THQ- R

Instructions: Below is a list of stressful events that you may have experienced. Please indicate whether you have experienced each event by checking the appropriate box (YES or NO). If you answer YES then please indicate:

(a) HOW MANY TIMES it happened to you (**if you don't know exactly please give a range, e.g., "50-100"**)
(b) Your approximate age (in years) when it FIRST happened to you,
(c) Your approximate age (in years) when it LAST happened to you (if it only happened once then write the same age as above),

Did any of these events happen to you?	Yes or No	If YES:
1. Has anyone ever tried to take something directly from you by using force or threat of deadly force, such as a stick up or mugging?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
2. Has anyone ever actually robbed you (i.e., stolen your personal belongings)?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
3. Has anyone every succeeded in breaking into your home when you weren't there?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
4. Has anyone succeeded in breaking into you home while you were there?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
5. Have you ever had a serious accident (at work, in a car, or somewhere else) in which you believed you could be killed or seriously harmed?	☐ ☐	# of TIMES:

Please specify: _____	Yes No	_____ Age FIRST: _____ Age LAST: _____
6. Have you ever experienced a natural disaster such as a tornado, hurricane, flood, major earthquake, etc., where you felt you or your loved ones were in danger of death or serious injury? Please specify: _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
7. Have you ever experienced a "man-mad" disaster such as a train crash, building collapse, fire, etc., where you felt you or your loved ones were in danger of death or serious injury? Please specify: _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
8. Have you ever been emotionally abused (e.g., belittled, humiliated, cursed at, threatened verbally) by a family member or significant other? Please state who emotionally abused you (e.g., mother): _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
9. Have you ever *directly* experienced a terrorist act, such as a bomb, stabbing, kidnapping? Please specify: _____ _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
10. Have you ever *directly* experienced war events, such as shelling, firefights, missile, or artillery alarm?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____

11. Have you ever experienced the divorce of your parents or parent figures?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
12. Have you ever seen someone seriously injured (i.e., life-threatening injury) or killed? Please specify: _____ _____	# of TIMES: _____	Age FIRST: _____
13. Have you ever seen dead human bodies (other than at a funeral) or had to handle dead human bodies (other than at a funeral) for any reason? Please specify: _____ _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST:
14. Have you ever had a spouse, romantic partner, or child die (include abortion or miscarriage)?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
15. Have you ever had a serious or life-threatening illness?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____

16. Have you ever received news of a serious injury, life-threatening illness, or unexpected death or someone close to you? Please specify: _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____

17. Have you ever had to engage in military combat (or something like it) or have you been in a situation that involved a threat to your life while in the military (or reserve) service? Please specify: _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
18. Has anyone ever made you have intercourse, oral, or anal sex against your will?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
19. Has anyone ever touched private parts of your body or made you touch theirs in a sexual way under force or threat (other than during events mentioned in #18 above)?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
20. Has anyone *in your family* ever had unwanted sexual contact with you (including events mentioned in #18 or #19 above)? Please specify persons' relationship to you: _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
21. Other than the incidents mentioned in Questions 18, 19, & 20 have there been any other situations in which another person tried to force you to have unwanted sexual contact?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
22. Has anyone, including family members or friends, ever attacked you *with* a gun, knife, or some other weapon?	☐ Yes ☐ No	# of TIMES: _____

		Age FIRST: _____ Age LAST: _____ _EFFECT: _____ _
23. Has anyone, including family members or friends, ever attacked you without a weapon and seriously injured you? Please specify persons' relationship to you: _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____ _
24. Has anyone in your family ever beaten, "spanked", burned, or pushed you hard enough to cause an injury? Please specify persons' relationship to you: _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____ _
25. Were you ever seriously neglected (i.e., left without appropriate supervision, help, and/or resources at a time when you were too young or too sick to take care of yourself)?	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____ _
26. Were you ever incarcerated (jailed), held captive, tortured, or kidnapped? Please specify: _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____ _

27. Other than those mentioned above, have you ever been in any other situation in which you feared you might be killed or seriously injured? Please briefly specify: _____ _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____
28. Have you experienced any other extraordinarily stressful situation(s) or event(s) (i.e., serious threat to you or a loved one) that is/ are not covered above? Please specify: _____ _____	☐ Yes ☐ No	# of TIMES: _____ Age FIRST: _____ Age LAST: _____

Appendix 7. Working Alliance Inventory

Instructions: Below is a list of statements and questions about experiences people might have with their therapy or therapist. Some items refer directly to your therapist with an underlined space -- as you read the sentences, mentally insert the name of your therapist in place of _____in the text. Think about your experience in therapy, and decide which category best describes your own experience.

IMPORTANT!!! Please take your time to consider each question carefully.

1. As a result of these sessions I am clearer as to how I might be able to change.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

2. What I am doing in therapy gives me new ways of looking at my problem.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

3. I believe___likes me.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

4. ___and I collaborate on setting goals for my therapy.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

5. ___and I respect each other.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

6. ___and I are working towards mutually agreed upon goals.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

7. I feel that___appreciates me.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

8. _____ and I agree on what is important for me to work on.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

9. I feel _____ cares about me even when I do things that he/she does not approve of.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

10. I feel that the things I do in therapy will help me to accomplish the changes that I want.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

11. _____ and I have established a good understanding of the kind of changes that would be good for me.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

12. I believe the way we are working with my problem is correct.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

Appendix 8. Instructions for Psychotherapy Process Q-Set

Psychotherapy Process Q-set
and
Trauma-Focused Addendum

The purpose of the 143 items of the Psychotherapy Process Q-set is to provide a basic language for the description and classification of therapy process. While built on general assumptions of psychotherapy as an interpersonal process, it is intended to be largely neutral with respect to any particular theory of therapy, and should permit the portrayal of a wide range of therapeutic interactions. It is hoped that the use of a standard language and rating procedure will provide the means for systematically characterizing patient-therapist interaction. The general purpose of the instrument is to provide a meaningful index of the therapeutic process with may be used in comparative analyses or studied in relation to pre- and post- therapy assessments. The addendum of 43 items is designed to provide a measure of trauma-specific therapy techniques, consonant with a variety of contemporary trauma therapy theories.

Instructions for using the PQS

When filling out the PQS, many raters have noted that they often feel confused about whether to rate an item "neutral" or "extremely uncharacteristic." A general rule of thumb is to rate something as "extremely uncharacteristic" if a process/technique was notably absent, whether intentional or unintentional. "Neutral" ratings are used when a process did not happen, but it did not appear that it *should* have happened. Refer to specific items for clarification on how to rate "neutral" vs. "uncharacteristic" for that specific item.

For example, consider the following item: "Therapist draws attention to patient's non-verbal behavior, e.g. body posture, gestures." If a client had no notable non-verbal behavior, a therapist would not be expected to comment on it; thus, that item should be rated as "neutral." But, if a client had obvious significant non-verbal behavior (e.g., constant finger-drumming, buries head in lap) but a therapist does not comment on it at all, such an absence of comment might be notable. The therapist might not make a comment about non-verbal behavior because it is generally not their practice to do so, or because of a belief that to do so would be contra-indicated for the client. Regardless of the motivation, in this instance, one would rate towards the "uncharacteristic" end of the scale.

One other area in which raters express difficulty is with regard to more subjective events, such as "Patient is anxious or tense (vs. calm and relaxed)." In these cases, a general rule of thumb is that explicit statements regarding the process (in this case, anxiety) should be given more extreme ratings than inferences. There are, of course, exceptions to this rule. If a client is having an obvious panic attack but does not directly state, "I feel anxious," they would of course be given a more extreme placement than the client who, at one

point in the session, notes that they are feeling some anxiety but seems to be managing it well.

Raters often occasionally express difficulty with how to rate conflicting events. For example, a patient may express significant anxiety at some points in the session but also express significant relaxation at other points. It is up to the rater to determine which affect was more salient or important to the session. Occasionally, raters will use ratings closer to neutral to express the tempering of an extreme event. For example, a client who was intensely anxious for a brief period in a session but otherwise deeply calm may receive a rating of 6-7, as opposed to someone who was highly anxious for a brief period but then emotionally neutral for the majority of the session. The latter person may receive a rating of 7-8.

You may choose to write in brief explanations of your ratings following each item. Doing so is not required, but if you find it helpful or necessary, you have that option. Also feel free to use that space to write questions about the item that you feel may be useful to the experimenter.

Please rate the last 12 therapy sessions you have had with this client using the following rating scale:

9: Extremely characteristic or salient
8: Quite characteristic or salient
7: Fairly characteristic or salient
6: Somewhat characteristic or salient
5: Relatively neutral or unimportant
4: Somewhat uncharacteristic or negatively salient
3: Fairly uncharacteristic or negatively salient
2: Quite uncharacteristic or negatively salient
1: Extremely uncharacteristic or negatively salient

Note: You may wish to tear off this page, so that you do not have to flip back and forth as you fill out the questionnaire.

Appendix 9. PQS and TFPPI Prototype Items

General psychodynamic prototype items	
Item 6	Therapist is sensitive to the patient's feelings, attuned, empathic
Item 18	Therapist conveys non-judgmental acceptance
Item 36	Therapist points out use of patient's defensive maneuvers
Item 67	Therapist interprets warded-off wishes/feelings/ideas
Item 93	Therapist is neutral
Item 100	Therapist draws parallels between his/her relationship with the patient and her relationships with others in her life

Trauma-related work on shame/guilt and meaning	
Item 103	Therapist and patient work to reconstruct memories of the traumatic event
Item 106	The therapy focuses on helping the client to find a sense of meaning regarding the trauma
Item 110	Patient discusses experiences of shame or self-blame about the trauma
Item 111	Patient discusses guilt for having survived or lived through the traumatic event
Item 112	Patient discusses difficulties in sexuality resulting from the traumatic event.
Item 133	Patient discusses feelings of grief/loss/mourning related to the traumatic event.

General CBT prototype items	
Item 17	Therapist actively exerts control over the interaction
Item 27	Therapist gives explicit advice and guidance
Item 31	Therapist asks for more information or elaboration
Item 45	Therapist adopts a supportive stance
Item 85	Therapist encourages patient to try new ways of behaving with others

Trauma-specific Prolonged Exposure items	
Item 114	Patient tells or reads the story of the trauma multiple times within a session until distress is reduced
Item 115	Therapist points out or helps client evaluate distortions in patient's thinking
Item 116	Patient completes a homework assignment given by the therapist

Item 117	Patient writes out a detailed account of traumatic event or events during or before a session
Item 118	Therapist directs patient to refrain from avoiding memories, feelings or other reminders of the trauma while in the session
Item 119	Therapist accompanies patient to a place reminiscent of a traumatic event

Stress Inoculation Therapy Items	
Item 105	Therapist provides psychoeducation about effects of trauma exposure
Item 123	Therapist facilitates discussion of how somatic sensations contribute to anxiety
Item 135	Therapy includes guided imagery techniques
Item 136	Therapy includes progressive muscle relaxation
Item 137	Therapy includes breathing techniques
Item 139	Therapist aids client in recognizing triggers of flashbacks

Appendix 10. Words for the Word-Stem Completion Task

Word Type	Target Word	Match Word	Stem
Assault words	Fear	Festival	Fe_____
	Victim	Vicarious	Vic_____
	Tortured	Torrent	Tor_____
	Forced	Formal	For_____
	Humiliated	Humanity	Hum____
	Terrified	Terrain	Ter_____
	Battered	Bathed	Bat_____
	Crushed	Crust	Cru_____
	Pain	Pack	Pa_____
	Weapon	Weasel	Wea____
	Trapped	Trading	Tra_____
	Helpless	Helmet	Hel_____
	Abused	Abide	Ab_____
	Afraid	Africa	Afr_____
	Controlled	Contribution	Con_____
	Forced	Formal	For_____
	Grabbed	Grapple	Gra_____
	Pinned	Pitch	Pi_____
	Violated	Video	Vi_____
	Whore	Which	Wh_____
General Threat	Bomb	Bowl	Bo_____
Words	Tumor	Tumble	Tum____
	Infection	Infinite	Inf_____
	Cheated	Cheapen	Che_____
	Failure	Faith	Fai_____
	Drowning	Drowsy	Dro_____
	Mortuary	Mortgage	Mor_____
	Rejection	Rejuvenate	Rej_____
	Cancer	Canal	Can_____
	Stroke	Stripe	Str_____
	Widowed	Widen	Wid_____
Positive Words	Wise	Will	Wi___
	Adorable	Addition	Ad___
	Friendly	Fried	Fri___
	Loyal	Loaf	Lo___
	Protected	Prolong	Pro___
	Secure	Second	Sec___
	Treasure	Treatise	Tre___
	Fascinate	Fast	Fa___
	Angel	Another	An___
	Reward	Rewind	Rew___
	Invigorated	Invoke	Inv___
	Elated	Elevator	El____

Word Type	Target Word	Match Word	Stem
Neutral Words	Diver	Divest	Di___
	Matriculate	Materialistic	Mat_____
	Pertinent	Personnel	Per_____
	Connection	Conference	Con_____
	Compile	Comment	Com____
	Wheat	Wheel	Whe____
	Introduction	Interval	Int_____
	Proposal	Properly	Pro_____
	Variance	Varsity	Var_____
	Diminish	Diminutive	Dim____
	Locomotive	Localization	Loc_____

Appendix 11. Stroop Words

Neutral	**Positive**	**Depression**	**Anxiety**	**Trauma**
List One	*List One*	*List One*	*List One*	*List One*
Strawberry	Affection	Despised	Cyst	Stalker
Apricot	Snuggle	Incompetent	Stress	Rape
Lemon	Freedom	Hostile	Funeral	Struggle
Grape	Respect	Insult	Worry	Attack
Plum	Beautiful	Lonely	Coffin	Nightmare
Grapefruit	Heart	Pathetic	Nervous	Assault
Apple	Birthday	Persecuted	Anxiety	Penetrate
Tangerine	Baby	Unloved	Death	Scream
List Two	*List Two*	*List Two*	*List Two*	*List Two*
Cantaloupe	Miracle	Meaningless	Casualty	Slap
Banana	Love	Disgusting	Fatal	Threaten
Watermelon	Puppy	Intimidated	Virus	Ashamed
Pineapple	Happy	Mistake	Hearse	Dirty
Peach	Pretty	Worthless	Lethal	Pushed
Mango	Sunlight	Scorn	Accident	Choke
Raisin	Fun	Stupid	Cemetery	Bitch
Cherry	Confidant	Useless	Illness	Beaten

Appendix 12: Trauma-Related Image Samples

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